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(54) STABLE EMULSIFIED COMPOSITION AND FOOD CONTAINING THE SAME

(57)Abstract:
PURPOSE: To obtain a stable emulsified composition, containing a specific emulsifying agent, using a (hydrous) polyhydric alcohol as a hydrophilic medium, capable of stably dispersing docosahexaenoic acid (DHA), eicosapentaenoic acid (EPA), etc., in the hydrophilic medium and useful for beverages, frozen sweets, confectioneries, daily or bakery products, fishery or livestock processed foods, etc.
CONSTITUTION: This composition is obtained by emulsifying (C) an antioxidant and (D) at least one of DHA or EPA and a natural oil containing them with (A) a polyglycerol ester of a fatty acid having ≥10 HLB (a 12-20C fatty acid) alone or further a sucrose ester of the fatty acid (a 12-20C fatty acid) and/or lecithin as an emulsifying agent and (B) a (hydrous) polyhydric alcohol as a hydrophilic medium. The resultant composition is stable to the oxidation and good in keeping quality without emitting a malodor.

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CLAIMS

[Claim(s)]
[Claim 1] The natural oil of the derivative of the docosa-hexaenoic acid as an active ingredient, eicosapentaenoic acid, and these acids which contains a kind or them at least, The emulsifier of sufficient amount to be able to emulsify an active ingredient at least, and an antioxidant, They are independent or this, sucrose fatty acid ester (carbon numbers 12-20 of a fatty acid), and/or lecithin. from a hydrophilic medium -- becoming -- an emulsifier -- ten or more HLB polyglyceryl fatty acid ester (carbon numbers 12-20 of a fatty acid) -- And the stable emulsification constituent characterized by a hydrophilic medium being polyhydric alcohol or water polyhydric alcohol.
[Claim 2] The emulsification constituent according to claim 1 whose active ingredient is natural oil containing the derivative of docosa-hexaenoic acid, eicosapentaenoic acid, or these acids.
[Claim 3] The emulsification constituent according to claim 1 whose natural oil is fish oil, a yolk oil, or an oil of the algae origin.
[Claim 4] The emulsification constituent according to claim 1 whose content of the natural oil of the derivative of docosa-hexaenoic acid, eicosapentaenoic acid, and these acids which contains a kind or them at least is about 0.0001 - 50 % of the weight among an emulsification constituent.
[Claim 5] The emulsification constituent according to claim 1 with which polyglyceryl fatty acid ester has the average degree of polymerization of the glycerol of 6-15.
[Claim 6] The emulsification constituent according to claim 1 whose polyglyceryl fatty acid ester is 13 or more HLB, the carbon numbers 14-20 of a fatty acid, and the average degree of polymerization 8-15 of a glycerol.
[Claim 7] The emulsification constituent according to claim 1 whose polyglyceryl fatty acid ester is deca glycerol monostearin acid ester, deca glycerol mono-oleate, or deca glycerol mono-palmitic-acid ester.
[Claim 8] the mixing ratio (weight ratio) of polyglyceryl fatty acid ester and sucrose fatty acid ester -- about 1:0 -- the emulsification constituent according to claim 1 which is .05-1:1.
[Claim 9] The emulsification constituent according to claim 1 whose mixing ratio (weight ratio) of polyglyceryl fatty acid ester and lecithin is about 1:0.005 to 1:0.5.
[Claim 10] The emulsification constituent according to claim 1 whose mixing ratio (weight ratio) of polyglyceryl fatty acid ester, sucrose fatty acid ester, and lecithin is about 1:0.05:0.005 to 1:1:0.5.
[Claim 11] The emulsification constituent according to claim 1 whose content of an emulsifier is about 0.01 - 20 % of the weight among an emulsification constituent.
[Claim 12] The emulsification constituent according to claim 1 whose content of polyglyceryl fatty acid ester is about 0.01 - 20 % of the weight among an emulsification constituent.
[Claim 13] The emulsification constituent according to claim 1 whose polyhydric alcohol as a hydrophilic medium is a glycerol, a sorbitol, or propylene glycol.
[Claim 14] The emulsification constituent according to claim 1 whose water polyhydric alcohol as a hydrophilic medium is about 50 or less % of the weight of water content.
[Claim 15] The emulsification constituent according to claim 1 which are one sort or two sorts or more of mixture chosen from the group which an anti-oxidant becomes from an ascorbic acid,

isoascorbic acid and those salts, catechins, a catechins content natural extract, and tocopherols.

[Claim 16] The emulsification constituent according to claim 15 whose anti-oxidant is the mixture of an ascorbic acid, isoascorbic acid or those salts, and a catechins or a catechins content natural extract.
[Claim 17] The emulsification constituent according to claim 1 whose content of an antioxidant is about 0.001 - 20 % of the weight among an emulsification constituent.
[Claim 18] the emulsifier to an active ingredient -- comparatively (weight ratio) -- about 1:0 -- the emulsification constituent according to claim 1 which is .1-1:1.
[Claim 19] The emulsification constituent according to claim 1 which contains edible oil and fat further when lecithin is used as an emulsifier.
[Claim 20] an emulsification constituent according to claim 1 is added, and it becomes so that the content in the food of docosa-hexaenoic acid and/or eicosapentaenoic acid may become about 0.0001 - 1 % of the weight -- liquefied or half-solid-like food.
[Claim 21] Food according to claim 20 whose liquefied food is a carbonated drink, a lactic acid bacteria beverage, a fruits drink, or cow's milk.
[Claim 22] Food according to claim 20 whose half-solid-like food is yogurt or a pudding.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] This invention relates to the stable emulsification constituent about the natural oil of the derivative of docosa-hexaenoic acid, eicosapentaenoic acid, and these acids which contains a kind or them at least. The emulsification constituent of this invention is desirable although it is used for various food, for example, a drink, frozen desert, confectionery, dairy products, a bakery product, a water zootechnics processed food, etc.
[0002]
[Description of the Prior Art] It is the straight chain higher unsaturated fatty acid that in fish oil mainly contained, and having bioactive, such as a blood cholesterol level fall operation, a ** gun operation, an anti-thrombus operation, and an improvement operation in study ability, is reported, and docosa-hexaenoic acid (Following DHA is called) and eicosapentaenoic acid (Following EPA is called) are one of the food materials which attract attention most now. [many]
[0003] However, since EPA has five double bonds in 1 molecule and DHA has six double bonds in 1 molecule, receiving oxidation very easily and coming to generate a return fish (****) peculiar to fish oil according to slight oxygen, heat, light, an oxidation catalyst, etc., is known. In using the fish oil containing such a straight chain higher unsaturated fatty acid, in order to prevent antioxidizing or generating of ****, various kinds of techniques are proposed.
[0004] For example, the approach (JP,6-49479,A) of stabilizing omega-3 unsaturated fatty acid with emulsifiers, such as the margarine (JP,2-203741,A) and Tween 20 which distributed the capsule which added a tocopherol and/or lecithin to the fish oil addition milk powder (JP,4-346749,A) and the higher unsaturated fatty acid which blended vitamin C and/or its salt, and was covered with edible coating, sucrose fatty acid ester, a sorbitan fatty acid ester, and lecithin, etc. is learned.
[0005] However, not to acquire the effectiveness may be satisfied with any case of effectiveness, but to obtain a more stable emulsification constituent is desired. Then, this invention persons came to complete a header and this invention for the ability of a stable emulsification constituent to be obtained by using a specific emulsifier and using polyhydric alcohol or water polyhydric alcohol as a hydrophilic medium, as a result of examining wholeheartedly how to make stability distribute DHA, EPA, etc. in a hydrophilic medium.
[0006]
[Means for Solving the Problem] This invention The natural oil of the derivative of the docosa-hexaenoic acid as an active ingredient, eicosapentaenoic acid, and these acids which contains a kind or them at least, The emulsifier of sufficient amount to be able to emulsify an active ingredient at least, and an antioxidant, They are independent or this, sucrose fatty acid ester (carbon numbers 12-20 of a fatty acid), and/or lecithin. from a hydrophilic medium -- becoming -- an emulsifier -- ten or more HLB polyglyceryl fatty acid ester (carbon numbers 12-20 of a fatty acid) -- And the stable emulsification constituent whose hydrophilic medium is polyhydric alcohol or water polyhydric alcohol, and the food containing it are offered.
[0007] The emulsification constituent of this invention is an emulsification constituent with which the natural oil containing the derivative of DHA, EPA, or these acids or them was made

into the active ingredient, and these active ingredients were distributed by homogeneity and homogeneity in the hydrophilic medium as an oil droplet. the emulsification constituent of this invention -- setting -- as an emulsifier -- ten or more HLB polyglyceryl fatty acid ester (carbon numbers 12-20 of a fatty acid) -- it is indispensable independent or in order for using polyhydric alcohol or water polyhydric alcohol as a hydrophilic medium to make stability hold using mixture with this, sucrose fatty acid ester (carbon numbers 12-20 of a fatty acid), and/or lecithin.

[0008] Hereafter, each component in the emulsification constituent of this invention is explained to a detail. The derivatives (hereafter, the derivative of DHA, EPA, and these acids is synthesized, and an active ingredient is called) of DHA as an active ingredient in the emulsification constituent of this invention, EPA, and these acids may be any of synthetic compounds or a natural article, and may be the gestalt of the natural oil containing these acids. What is manufactured by a microorganism besides a chemical composition etc. is included by synthetic compounds. A natural article means that by which extract purification was carried out from the natural oil containing the derivative of DHA, EPA, or these acids by approaches, such as a well-known approach, for example, squeezing, solvent extraction, steam distillation, molecular distillation, supercritical fluid extraction, and a column chromatography. A pure article or a crude material is sufficient as the active ingredient in this invention.

[0009] The natural oil used for this invention means the oil of the natural product origin containing the derivative of DHA, EPA, or these acids. Especially the natural oil used in this invention is not limited, but the thing originating in all the origins of seaweed, a microorganism, an animal, vegetation, etc. can be used for it. As a desirable example of natural oil, fish oil (for example, a cuttlefish oil, sardine oil, a krill oil, a bonito oil, the Sabah oil, a salmon oil, a Pacific saury oil, a tare an oil, a tuna oil, etc.), a yolk oil, the oil of the algae origin, etc. are mentioned, and fish oil and the oil of the algae origin are more desirable. Moreover, what condensed the above natural oil by what was given to various processings (for example, deordorization processing by the bleaching processing by the deoxidation processing by alkali, such as degumming processing by phosphating etc. and caustic alkali of sodium, etc., the activated clay, etc., steam distillation, etc.), judgment, fractionation, enzyme processing, etc. is included by the natural oil in this invention.

[0010] As for the derivative of DHA or EPA used in this invention, what does so at least the bioactive which DHA or EPA has is desirable, and all the derivatives in which such bioactive is shown are included in this invention. As an example of the derivative of DHA or EPA, a salt, an amide, phospholipid, a monoglyceride, diglyceride, ester (for example, methyl ester, ethyl ester, propyl ester, cane-sugar ester, etc.), etc. are mentioned, and a monoglyceride, diglyceride, and ethyl ester are desirable in these.

[0011] Generally the content of the active ingredient in the emulsification constituent of this invention is 0.0001 - 50 % of the weight, and is 0.1 - 25 % of the weight preferably. The content of such an active ingredient is suitably chosen in consideration of the use application of an emulsification constituent, the purification purity of an active ingredient, the content of the active ingredient in natural oil, the enrichment of the natural oil containing an active ingredient, etc. For example, when an active ingredient is a pure article, in consideration of the bioactive strength, it can also consider as low concentration like about 0.0001 - 0.1 % of the weight, and when stronger activity is desired, in consideration of impure oil not existing, it can also consider as high concentration like about 0.1 - 50 % of the weight. Moreover, if this natural oil is condensed when an active ingredient is the gestalt of natural oil, since it can also consider as low concentration since the bioactive becomes strong, and impure oil decreases on the other hand, it can also consider as high concentration.

[0012] In this invention, it is ten or more HLB as an emulsifier, and the polyglyceryl fatty acid ester of 12-20 is used for the carbon number of a fatty acid at least. Such polyglyceryl fatty acid ester has [especially / other emulsifiers] the high emulsion stability under acidity, and the natural oil containing the derivative of DHA, EPA, and these acids and them can be maintained at stability under acidity for a long period of time. Polyglyceryl fatty acid ester is independent, or can be used by request as the mixture of this and sucrose fatty acid ester, the mixture of this and lecithin, and mixture of this, sucrose fatty acid ester, and lecithin. Sucrose fatty acid ester

and lecithin act auxiliary to stabilization of emulsification. For example, when using the emulsification constituent of this invention for a drink etc., it is desirable to use mixture with polyglyceryl fatty acid ester, sucrose fatty acid ester, and/or lecithin as an emulsifier.
[0013] In addition, since lecithin generally cannot melt into water easily when using lecithin as an emulsifier, it is desirable to make it dissolve in edible oil and fat (example: coconut oil, gamma-linolenic acid oil, etc.) beforehand, and to use. The amounts of the edible oil and fat used in that case are about 1:1 - 1:20 (weight ratio) to lecithin. The emulsifier in this invention is used in sufficient amount to be able to emulsify an active ingredient in an emulsification constituent at least. The oil droplet whose sufficient amount to be able to emulsify an active ingredient is a dispersed phase means sufficient amount for homogeneity and homogeneity to distribute in a hydrophilic medium. Generally, the content in the emulsification constituent of an emulsifier is about 0.01 - 20 % of the weight, and its about 0.5 - 10 % of the weight is desirable. In consideration of the content of an active ingredient etc., the content of this emulsifier is said within the limits, and is chosen suitably. Generally, as for the rate of an emulsifier to an active ingredient, 1:0.1-1:1 (weight ratio) is desirable.
[0014] Moreover, although various kinds of additives which contain the above-mentioned edible oil and fat (solvent of lecithin) and an oil solubility component like the after-mentioned in the emulsification constituent of this invention may be added, the content of an emulsifier can be made to increase depending on such a class and the amount of the additive used. However, generally the content of an emulsifier is enough within the limits of the above. As an emulsifier in this invention, when mixture with polyglyceryl fatty acid ester, sucrose fatty acid ester, and/or lecithin is used, it is desirable to use mixture with which the rate of the polyglyceryl fatty acid ester in the mixture becomes at least 50 % of the weight. As for the mixing ratio of polyglyceryl fatty acid ester and sucrose fatty acid ester, abbreviation 1:0.05-1:1 (weight ratio) is desirable, and, as for the mixing ratio of polyglyceryl fatty acid ester and lecithin, specifically, about 1:0.005 to 1:0.5 (weight ratio) is desirable. Moreover, as for the mixing ratio of polyglyceryl fatty acid ester, sucrose fatty acid ester, and lecithin, about 1:0.05:0.005 to 1:1:0.5 (weight ratio) is desirable.
[0015] the polyglyceryl fatty acid ester used in this invention -- being related -- HLB -- ten or more -- desirable -- 12-20 -- more -- desirable -- 13-16 -- further -- more -- desirable -- 14-16 -- it is -- the carbon number of a fatty acid -- 12 or more -- desirable -- 12-20 -- it is 14-18 more preferably. Moreover, as for the average degree of polymerization of a glycerol, 6-15 are desirable, and 8-10 are more desirable. As a desirable example of polyglyceryl fatty acid ester, hexa glycerol monostearin acid ester, deca glycerol monostearin acid ester, deca glycerol mono-oleate, deca glycerol mono-myristic-acid ester, deca glycerol mono-palmitic-acid ester, etc. are mentioned, and deca glycerol monostearin acid ester, deca glycerol mono-oleate, and especially deca glycerol mono-palmitic-acid ester are desirable in them. independent [in these polyglyceryl fatty acid ester] in this invention -- or it can mix and use.
[0016] As a content in the emulsification constituent of polyglyceryl fatty acid ester, about 0.01 - 20 % of the weight is desirable, and especially about 0.2 - 10 % of the weight is desirable. In consideration of the amount of the content of an active ingredient, the sucrose fatty acid ester described below, and the lecithin used etc., the content of polyglyceryl fatty acid ester is said within the limits, and is chosen suitably. It is ten or more HLB, and 12 or more things have the desirable carbon number of a fatty acid, and the sucrose fatty acid ester used in this invention has the more desirable thing of 12-20. As a desirable example of sucrose fatty acid ester, cane-sugar monostearin acid ester, cane-sugar mono-oleate, cane-sugar mono-palmitic-acid ester, etc. are mentioned. independent [in these sucrose fatty acid ester] in this invention -- or it can mix and use.
[0017] As a content in the emulsification constituent of sucrose fatty acid ester, about 0.1 - 5 % of the weight is desirable. In consideration of the content of an active ingredient, the amount of the polyglyceryl fatty acid ester used, the amount of the lecithin used described below, etc., the content of sucrose fatty acid ester is said within the limits, and is chosen suitably. The lecithin used in this invention means phospholipid, such as phosphatidylcholine, phosphatidylethanolamine, phosphatidylinositol, phosphatidic acid, phosphatidylserine, and

sphingomyelin, in this invention, these components are named generically and lecithin is called.
[0018] As lecithin used in this invention, the thing originating in all the origins, such as an animal, vegetation, yeast, and mold, can be used. As a desirable example of the lecithin used in this invention, vegetable lecithin (for example, a soybean lecithin, cone lecithin, rapeseed lecithin, etc.), yolk lecithin, judgment lecithin, zymolysis lecithin, etc. are mentioned, and a soybean lecithin, yolk lecithin, and zymolysis lecithin are more desirable in these. independent [in these lecithin] in this invention -- or it can mix and use.
[0019] Judgment lecithin means what carried out fractionation of the specific component using the difference of solubility from vegetable lecithin or yolk lecithin using organic solvents, such as ethanol. Zymolysis lecithin makes phospholipase act on vegetable lecithin, yolk lecithin, judgment lecithin, etc., and means what is obtained by making hydrolysis, a transition reaction, etc. perform. Although various things are obtained according to the class of lecithin, or the class of phospholipase, in this invention, zymolysis lecithin synthesizes these and calls them zymolysis lecithin. Any zymolysis lecithin of a class can be used in this invention.
[0020] As a content in the emulsification constituent of lecithin, about 0.001 - 2 % of the weight is desirable. In consideration of the amount of the content of an active ingredient, polyglyceryl fatty acid ester, and the sucrose fatty acid ester used etc., the content of lecithin is said within the limits, and is chosen suitably. In this invention, polyhydric alcohol or water polyhydric alcohol is used as a hydrophilic medium. If these hydrophilic media are used, compared with the case where it carries out through a water independent, generating of **** can be prevented more, and an emulsification constituent with high preservation stability can be obtained. Moreover, if these hydrophilic media are used, compared with the case where it carries out through a water independent, it is the same energy, and especially when the small emulsification constituent of the particle diameter of an oil droplet can be obtained more, for example, a small emulsification constituent of the particle diameter of an oil droplet like soft drinks is desired, it is advantageous.
[0021] The water content of the water polyhydric alcohol used in this invention has about 50 or less desirable % of the weight, and its about 30 or less % of the weight is more desirable. As a desirable example of polyhydric alcohol, a glycerol, a sorbitol, propylene glycol, etc. are mentioned and a glycerol and a sorbitol are more desirable in these. As a desirable example of water polyhydric alcohol, glycerol water, about 50 - 70-% of the weight sorbitol water, etc. are mentioned about 60 to 90% of the weight.
[0022] As a desirable example of the antioxidant used in this invention An ascorbic acid, isoascorbic acid or those salts (for example, an alkali-metal salt, an alkaline-earth-metal salt, etc.), catechins, a catechins content natural extract, etc. are mentioned. Specifically L-ascorbic acid, sodium L-ascorbate, erythorbic acid, Ascorbic acids, such as sodium erythorbate; GAROKATEKIN, epigallocatechin, Catechins, such as epicatechin, epigallocatechin gallate, and epicatechin gallate; A tea extract, Catechins content natural extracts, such as an apple extract, a grape seed extract, a sunflower seed extract, and a rice bran extract, etc. are mentioned, and L-ascorbic acid, sodium L-ascorbate, and a tea extract are desirable in these. These antioxidants can be used with one sort or two sorts or more of mixture.
[0023] The above-mentioned catechins content natural extract can extract the leaf of tea (example: green tea, oolong tea, tea, roasted tea, etc.), apple pulp, a grape seed, a sunflower seed, etc. with organic solvents, such as water, and ethanol, chloroform, and can refine and obtain them by the well-known approach. A pure article or a crude material is sufficient as the catechins content natural extract used in this invention.
[0024] Moreover, well-known antioxidants, such as tocopherols (example: an extract tocopherol, dl-alpha-tocopherol, etc.), polyphenol (example: rutin, myricetin, myricitrin, etc.), spice extracts (example: a rosemary, SAGE, etc.), acids (example: chlorogenic acid, caffeic acid, ferulic acid, gallic acid, etc.) of the natural product origin, dibutylhydroxytoluene (BHT), and burylhydroxyanisole (BHA), can be made to use together in addition to the above-mentioned antioxidant. When these antioxidants can also be used with one sort or two sorts or more of mixture and use together these antioxidants and the above-mentioned antioxidant, it is effective with prevention of an after-tack smell peculiar to ****.

[0025] Preferably [using it for consuming the dissolved oxygen in an emulsification constituent more than a complement], and generally, the antioxidant of this invention is 0.001 - 20 % of the weight, and is 0.01 - 20 % of the weight preferably. According to the class of unsaturated fatty acid in an active ingredient or its content, the purity of an active ingredient, the class of antioxidant, the amount of dissolved oxygen in an emulsification constituent, etc., the amount of this antioxidant used is within the limits, and is changed [above-mentioned]. Moreover, when some kinds of antioxidants are used in this invention, according to the class of the antioxidant, the purpose of using an emulsification constituent, etc., the amount of each antioxidant used is above-mentioned within the limits, and is determined suitably.
[0026] The emulsification constituent of this invention may be made to contain other additives by request in order to raise the emulsifiability of an emulsification constituent, thermal resistance, acid resistance, preservation stability, the emulsion stability in the inside of food, etc. As long as it is not the matter which promotes oxidation of the derivative of DHA, EPA, or these acids as such an additive, either of a well-known food additive can be used and a water-soluble thing is sufficient also as an oil solubility thing. As an example of such an additive, giant-molecule polysaccharide, preservatives (example: soluble starch, a dextrin, cyclodextrin, gum arabic, pectin, xanthan gum, etc.) (example: p-hydroxybenzoic esters, benzoic acid, etc.), a specific-gravity-adjustment agent [SAIB (shoe cloth acetate ISOBUCHIRETO)], a proteolysis object, vitamins (example: casein, gelatin, etc.), coloring matter (example: alpha-carotene, beta carotene, lycopene, etc.), perfume, unsaturated fatty acid (example: alpha-linolenic acid, gamma-linolenic acid, linolic acid, etc.) etc. be mentioned. The amount of these additives used is suitably determined according to the purpose of use.
[0027] As for the emulsification constituent of this invention, it is desirable that the particle diameter of the oil droplet in an emulsification constituent sets 0.25 micrometers or less to 0.2 micrometers or less preferably according to a use application. By doing so, the muddiness produced when it is used to aquosity food like soft drinks, and a neck ring (what the particle of the oil droplet in an emulsification constituent surfaced on the drink front face according to the specific gravity difference, and gathered is called) and precipitate can be prevented, and stable food can be obtained, without performing specific gravity adjustment. Moreover, since a specific-gravity-adjustment agent (SAIB) is not used in that case, an emulsification constituent can be manufactured, without performing no heating actuation in a manufacture process.
[0028] The emulsification constituent of this invention can carry out the mixed dissolution of each of water-soluble materials and an oil solubility component separately beforehand, and can manufacture it by adding oil solubility component mixture to the water-soluble-materials mixture, and distributing homogeneity and homogeneity. It is desirable to use emulsifiers, such as a colloid mill, a homomixer, and a high-pressure homogenizer, in the case of the emulsification constituent adjustment, and it is desirable to stop the heat generated in the case of emulsification with a cooling system etc.
[0029] Thus, to oxidation, the obtained emulsification constituent is stable, and does not have generating of an odor, and prolonged preservation is possible for it and it is used suitable for various food, such as a drink, frozen desert, confectionery, dairy products, a bakery product, and a water zootechnics processed food. Without spoiling the properties (for example, a configuration, a smell, the taste, a **** rate, a color tone, etc.) of the food itself, the food containing the emulsification constituent of this invention is the food which the derivative of DHA, EPA, or these acids contained, and produces neither a neck ring nor precipitate.
[0030] The emulsification constituent of this invention can be used for various kinds of food as a food additive, and a liquid, the shape of a half-solid, and solid any are sufficient as food. The following are mentioned as the example.
Drink: A carbonated drink, a fruits drink, the drink made from milk, a vegetable drink, soybean milk, etc.
Frozen desert: Ice cream, a Popsicle, sherbet, etc.
Confectionery: Jelly, a candy, gum, Cookie, a cake, chocolate, a pie, a biscuit, a pudding, etc.
Dairy products: Cow's milk, yogurt, a cheese head, butter, margarine, mayonnaise, salad dressing, etc.

Bakery product: In addition to this, they are :animal feed, drugs, quasi drugs, etc., such as cooking article:omelets, such as seasoning:bean paste, such as water zootechnics processed food:hums, such as pans, noodles, and a pasta, a sausage, boiled fish paste, and a fishcake tube, dripping, and the source, an omelet, Calais, a stew, a hamburger, a croquette, soup, an as-you-like-it pancake, and a Chinese meat dumpling, [0031]. About the amount of the emulsification constituent used of this invention to the above food, it is added so that the content in the food of the natural oil containing the derivative of DHA(s) and EPA which are generally an active ingredient, or these acids, or them may become about 0.0001 - 1 % of the weight, and it is added so that it may become about 0.001 - 0.1 % of the weight preferably.
[0032] The emulsification constituent in this invention can be used for various food using a well-known approach. Although an example is shown and this invention is explained still more concretely hereafter, this invention is not limited to these. In addition, in the following examples, especially % expresses weight %, unless it is shown.
[0033]
[Example] Example 1: The emulsification constituent was manufactured using the active ingredient shown below, the antioxidant, and the hydrophilic medium, using the polyglyceryl fatty acid ester shown in Table 1 as an effect emulsifier by the class of polyglyceryl fatty acid ester, and the stability was examined.
[0034]
Formula of an emulsification constituent: Content (%)
[Active ingredient]
Purification fish oil 20 (about 25% of DHA contents, about 10% of EPA contents)
[Emulsifier]
Polyglyceryl fatty acid ester (refer to Table 1) 5 [Antioxidant]
L-ascorbic acid 0.5 [Hydrophilic medium]
Water 24.5 Glycerol 50 The sum total The emulsification constituent was manufactured by dissolving a glycerol, polyglyceryl fatty acid ester, and L-ascorbic acid in 100 (the manufacture approach and the soundness test approach of an emulsification constituent) water, and emulsifying using a homogenizer, after adding purification fish oil subsequently to this and carrying out stirring distribution. That condition was observed after leaving this emulsification constituent for one week at a room temperature or 60 degrees C. A result is shown in Table 1. O shows the condition that, as for x, the emulsification constituent has divided those without abnormalities into the bilayer, among Table 1.
[0035]
[Table 1]

ポリグリセリン 脂肪酸エステル	グリセリン 平均縮重合度	脂肪酸	HLB	1週間放置後の乳化組成物の状態	
				室温	60℃
テトラグリセリンモノステアリン 酸エステル	4	18:0	10	×	×
ヘキサグリセリンモノステアリン 酸エステル	6	18:0	12	○	×
デカグリセリンモノステアリン酸エステル	10	18:0	14	○	○
デカグリセリントリステアリン酸エステル	10	18:0	9	×	×
オクタグリセリンモノオレイン酸エステル	8	18:1	13	○	○
デカグリセリンモノオレイン 酸エステル	10	18:1	14	○	○
デカグリセリンモノミリスチン酸エステル	10	14:0	15	○	○
デカグリセリンモノラウリン 酸エステル	10	12:0	16	○	×
デカグリセリンモノカプリル 酸エステル	10	8:0	16	×	×

[0036] It is clear from Table 1 to have the effectiveness HLB excelled [effectiveness] in 13 or more and glycerol average degree of polymerization, and the carbon number of 8 or more and a fatty acid excelled [effectiveness] in 14 or more polyglyceryl fatty acid ester.
[0037] Example 2: Using the active ingredient shown in the effect following by the addition of polyglyceryl fatty acid ester, the emulsifier, the antioxidant, and the hydrophilic medium, as shown in Table 2, various contents of an active ingredient and an emulsifier were changed, the emulsification constituent was manufactured, and the stability was examined.
[0038]
Formula of an emulsification constituent: Content (%)
[Active ingredient]
Purification fish oil Refer to Table 2. (about 25% of DHA contents, about 10% of EPA contents)
[Emulsifier]
Deca glycerol mono-oleate Refer to Table 2. [Antioxidant]
L-ascorbic acid 0.5 [Hydrophilic medium]
Glycerol 40 Water Residue Sum total 100 [0039] (The manufacture approach and the soundness test approach of an emulsification constituent) The emulsification constituent was manufactured by dissolving glycerol and deca glycerol mono-oleate and L-ascorbic acid in water, and emulsifying using a homogenizer, after adding purification fish oil subsequently to this and carrying out stirring distribution. That condition was observed after leaving this emulsification constituent for one week at a room temperature. A result is shown in Table 2. O shows the condition that, as for x, the emulsification constituent has divided those without abnormalities into the bilayer, among Table 2.
[0040]
[Table 2]

精製魚油(%)	ポリグリセリンモノオレイン酸エステル	状態
1	0.1	○
10	0.1	×
40	0.1	×
1	2	○
10	2	○
40	2	○
1	10	○
10	10	○
40	10	○

[0041] When purification fish oil (about 25% of DHA contents, about 10% of EPA contents) is used as an active ingredient and polyglyceryl fatty acid ester is added so that the rate of polyglyceryl fatty acid ester to an active ingredient may become more than 1:0.05 (40:2), it is clear from Table 2 to have the outstanding effectiveness.
[0042] Example 3: The emulsification constituent was manufactured using the hydrophilic medium (glycerol water) or water shown in the effect following by the water content of a hydrophilic medium, and an active ingredient, an emulsifier and an antioxidant, and the stability was examined.
[0043]
Formula of an emulsification constituent: Content (%)
[Active ingredient]

Purification fish oil 20 20 20 20 (about 25% of DHA contents, about 10% of EPA contents)
[Emulsifier]
Deca glycerol mono-oleate 5 5 5 5 [Antioxidant]
Ascorbic acid 1 1 1 1 [Hydrophilic medium]
A glycerol - 30 52 74 Water 74 44 22 - Sum total 100 100 100 100 Hydrophilic medium water content (%) 100 60 300 [0044] (The manufacture approach and the soundness test approach of an emulsification constituent) The emulsification constituent was manufactured by dissolving deca glycerol mono-oleate and an ascorbic acid in the above-mentioned hydrophilic medium, and emulsifying using a homogenizer, after adding purification fish oil subsequently to this and carrying out stirring distribution. This emulsification constituent was diluted with ion exchange water 1000 times, and that flavor was evaluated. Moreover, the particle diameter of the oil droplet in an emulsification constituent was measured. the particle diameter of an oil droplet -- laser -- it measured using] by diffraction type particle-size-distribution meter SALD-110 [Shimadzu Corp. Furthermore, after saving this emulsification constituent for two weeks at 40 degrees C, it diluted with ion exchange water 1000 times similarly, that flavor was evaluated, and the particle diameter of the oil droplet in an emulsification constituent was measured.
[0045] These results are shown in Table 3. The notation in Table 3 shows evaluation according to the following flavor valuation basis.
Flavor valuation basis: -; **** is not sensed.
+; **** is sensed small.
+ +; **** is sensed.
+ ++; **** is sensed strong.
[0046]
[Table 3]

親水性媒体含水率 (重量%)	製造直後		42℃, 2週間保存後	
	香味評価	油滴の粒子径 (μm)	香味評価	油滴の粒子径 (μm)
100	++	0.86	+++	1.1
60	+	0.52	++	0.70
30	-	0.24	-	0.25
0	-	0.23	-	0.23

[0047] The emulsification constituent manufactured using the hydrophilic medium which has about 30% or less of water content showed the preservation stability which generating of **** was prevented and was excellent compared with the emulsification constituent manufactured using the hydrophilic medium with high water independent and water content so that clearly from Table 3. Moreover, the small emulsification constituent of the particle diameter of an oil droplet was obtained, so that the medium with low water content was used.
[0048] Example 4: The emulsification constituent was manufactured using the antioxidant shown in the effect table 4 by the class of antioxidant, the active ingredient shown in the following and an emulsifier, and the hydrophilic medium, and the stability was examined.
[0049]
Formula of an emulsification constituent: Content (%)
[Active ingredient]
Purification fish oil 20 (about 25% of DHA contents, about 10% of EPA contents)
[Emulsifier]
Deca glycerol monostearin acid ester 5 [Antioxidant]
Refer to Table 4. 1 [Hydrophilic medium]
Water 24 Glycerol 50 Sum total 100 [0050] (The manufacture approach and the soundness test approach of an emulsification constituent) The emulsification constituent was manufactured by dissolving a glycerol, deca glycerol monostearin acid ester, and an anti-oxidant in water, and emulsifying using a homogenizer, after adding purification fish oil subsequently to this and carrying out stirring distribution. However, among the anti-oxidants in Table 4, it was made to dissolve in purification fish oil, and an extract tocopherol and L-ascorbic acid palmitic-acid ester

manufactured the emulsification constituent. After saving this emulsification constituent for one week at 40 degrees C, it diluted with ion exchange water 1000 times, and that flavor was evaluated. A result is shown in Table 4. The notation in Table 4 shows evaluation according to the above-mentioned flavor valuation basis.
[0051]
[Table 4]

酸化防止剤	香味評価
ブランク	+++
L-アスコルビン酸	-
L-アスコルビン酸ナトリウム	-
エリソルビン酸	-
茶抽出物	-
リンゴ 抽出物	-
ブドウ 種子抽出物	-
ひまわり種子抽出物	-
没食子酸	+
抽出トコフェロール	++
L-アスコルビン酸パルミチン 酸エステル	++

[0052] It is clear from Table 4 that L-ascorbic acid, sodium L-ascorbate, erythorbic acid, a tea extract, an apple extract, a grape seed extract, and a sunflower seed extract have the outstanding antioxidizing effectiveness.
[0053] Example 5: Using the active ingredient shown in the effect following by the addition of an antioxidant, the emulsifier, the antioxidant, and the hydrophilic medium, as shown in Table 5, various contents of an antioxidant were changed, the emulsification constituent was manufactured, and the stability was examined.
[0054]
Formula of an emulsification constituent: Content (%)
Purification fish oil 20 (about 25% of DHA contents, about 10% of EPA contents)
[Emulsifier]
Deca glycerol monostearin acid ester 5 [Antioxidant]
L-ascorbic acid Refer to Table 5. Tea extract Refer to Table 5. [Hydrophilic medium]
Glycerol 50 Water Residue Sum total 100 [0055] (The manufacture approach and the soundness test approach of an emulsification constituent) The emulsification constituent was manufactured by dissolving a glycerol, deca glycerol monostearin acid ester, and an anti-oxidant (L-ascorbic acid or tea extract) in water, and emulsifying using a homogenizer, after adding purification fish oil subsequently to this and carrying out stirring distribution. After saving this emulsification constituent for one week at 40 degrees C, it diluted with ion exchange water 1000 times, and that flavor was evaluated. A result is shown in Table 5. The notation in Table 5 shows evaluation according to the above-mentioned flavor valuation basis.
[0056]
[Table 5]

L-アスコルビン酸(%)	茶抽出物(%)	香味評価
-	-	+++
0.001	-	++
0.1	-	+
1	-	-
5	-	-
-	1	+
-	20	-

[0057] L-ascorbic acid shows the antioxidizing effectiveness by 0.001% or more of addition, and Table 5 shows that a tea extract shows the antioxidizing effectiveness by 1% or more of addition, when purification fish oil (about 25% of DHA contents, about 10% of EPA contents) is used as an active ingredient. An antioxidant is considered that the antioxidizing effectiveness is demonstrated by the addition more than a complement although the dissolved oxygen in an emulsification constituent is consumed.
[0058] Example 6: As an effect emulsifier by the class of emulsifier, using mixture with the emulsifier shown in deca glycerol monostearin acid ester and Table 6, the emulsification constituent was manufactured using the active ingredient shown below, the antioxidant, and the hydrophilic medium, and the stability in the carbonated drink was examined.
[0059]
Formula of an emulsification constituent: Content (%)
[Active ingredient]
Purification fish oil 20 (about 25% of DHA contents, about 10% of EPA contents)
[Emulsifier]
deca glycerol monostearin acid ester 5 others -- emulsifier (refer to Table 6) 0.5 [Antioxidant]
L-ascorbic acid 0.5 [Hydrophilic medium]
Water 24 Glycerol 50 Sum total 100 [0060] (An emulsification constituent, and the manufacture approach and the stability test approach of a carbonated drink) The emulsification constituent was manufactured by dissolving in water the emulsifier and L-ascorbic acid which are shown in a glycerol, polyglyceryl fatty acid ester, and Table 6, and emulsifying using a homogenizer, after adding purification fish oil subsequently to this and carrying out stirring distribution. The carbonated drink was prepared by creating the carbonated drink syrup of the following formulas, adding aerated water to this syrup 50g using this emulsification constituent, and preparing to 200ml. After putting this carbonated drink for one month at a room temperature, the condition (existence of neck ring generation) of a carbonated drink was observed. A result is shown in Table 6. The notation in Table 6 shows evaluation according to the following valuation basis.
[0061] Valuation basis: -; the neck ring is not generated.
+; the neck ring is generated slightly.
+ +; the neck ring is generated.
+ ++; the neck ring is generated so much.
Formula of carbonic acid bevel-use syrup: Fruit-sugar grape-sugar liquid sugar (Brix 75 **) 26g Citric acid 0.4g L-ascorbic acid 0.1g Emulsification constituent 0.2g Ion exchange water 23.3g Sum total 50g [0062]
[Table 6]

他の乳化剤	ネックリングの生成
無添加	+
グリセリンモノオレイン酸エステル	++
ショ糖モノオレイン酸エステル	−
ソルビタンモノオレイン酸エステル	+
大豆レシチン	−
酵素分解レシチン	−

[0063] It turns out that it has the effectiveness which was excellent from Table 6 compared with the time of using the mixture of a deca glycerol monostearin acid ester independent, and deca glycerol monostearin acid ester and glycerol mono-oleate, and the mixture of deca glycerol monostearin acid ester and sorbitan monooleate ether when an emulsification constituent was used for a carbonated drink, and the mixture of deca glycerol monostearin acid ester and cane-sugar mono-oleate or the mixture of deca glycerol monostearin acid ester and lecithin was used as an emulsifier.
[0064] Example 7: The emulsification constituent (emulsification constituent A) containing an antioxidant and the emulsification constituent (emulsification constituent B) which does not contain an antioxidant were manufactured using the active ingredient shown in the effect following by the existence of an antioxidant, the emulsifier, the antioxidant, and the hydrophilic medium. Yogurt was prepared using these emulsification constituents A and B, and those stability was examined.
[0065]
Formula of an emulsification constituent: Content (%)
A B [Active ingredient]
Purification fish oil 20 20 (about 25% of DHA contents, about 10% of EPA contents)
[Emulsifier]
Deca glycerol mono-oleate 2 2 Cane-sugar monostearin acid ester 1 1 [Antioxidant]
Tea extract Nothing 3 [Hydrophilic medium]
Water 37 34 Glycerol 40 40 Sum total 100 100 [0066] (An emulsification constituent, and the manufacture approach and the stability test approach of yogurt) The emulsification constituents A and B were manufactured by dissolving a glycerol, an emulsifier, and an antioxidant (an antioxidant being added only when manufacturing the emulsification constituent B) in water, and emulsifying using a homogenizer, after adding purification fish oil subsequently to this and carrying out stirring distribution. The yogurt of the following formulas was prepared using these emulsification constituents A and B. 1% of lactic-acid-bacteria cultures was added after sterilization and cooling, and the transparence cup made from polyethylene was filled up with this yogurt, and it was cultivated at 28 degrees C for 20 hours. Subsequently, evaluation of a flavor was performed after performing a fluorescent lamp exposure (2000lux, one week). A result is shown in Table 7. The average in Table 7 is a value according to the following valuation basis.
[0067]
Formula of yogurt: Cow's milk 50% Skimmilk powder 5% Emulsification constituent 1% Ion exchange water 44% Sum total 100% [0068] flavor valuation-basis: -- five point: -- **** is not sensed.
Four points: **** is sensed small.
Three points: **** is sensed.
Two points: **** is sensed strong.
One point: **** is sensed extremely strong.
[0069]
[Table 7]

乳化組成物	平均値
A	3.2
B	4.3

[0070] Table 7 shows that the emulsification constituent containing an emulsifier and an

antioxidant shows the effectiveness which was excellent compared with the emulsification (antioxidant is not contained) constituent only containing an emulsifier.
[0071] Example 8: After adding the oily mixed solution in which 20g of fish oil, 8g of purification coconut oil, and 0.5g of soybean lecithins were dissolved to the solution made to dissolve polyglycerin aliphatic series ester 4g and 0.5g of sodium L-ascorbate in the mixture of effect glycerol 45g and 20g of water by the particle diameter of an oil droplet and making it agitate and distribute it, it emulsified with the high-pressure homogenizer and the uniform emulsification constituent of about 0.20 micrometers of particles of an oil droplet was manufactured (this invention article 1). the particle diameter of an oil droplet -- laser -- it measured using] by diffraction type particle-size-distribution meter SALD-110[Shimadzu Corp. Moreover, by lowering the pressure of a high-pressure homogenizer, except having set the particle of the oil droplet of an emulsification constituent to about 0.7 micrometers, the same actuation as the process of the above-mentioned this invention article 1 was performed, and about 0.7-micrometer emulsification constituent was obtained for the particle of an oil droplet (comparison article 1).
[0072] (1) After saving this invention article 1 for one week at 60 degrees C, it diluted with ion exchange water 1000 times. About the flavor of this diluent, organoleptics were carried out to ten persons' special panelist. The result is shown in Table 8. The organic-functions evaluation average in Table 8 is a value according to the following valuation basis.
[0073] organic-functions valuation-basis: -- five point: -- a nasty smell is not sensed at all.
Four points: A nasty smell is not sensed almost.
Three points: A reversion flavour (****) is sensed small.
Two points: A reversion flavour (****) is sensed considerably.
One point: A strong reversion flavour (****) is sensed.
[0074]
[Table 8]

試料	官能評価平均値	
	保存前	保存後
本発明品1	4.4	4.3

[0075] As for this invention article 1, after 60-degree-C preservation for one week does not sense the reversion flavour of the DHA origin almost so that clearly from the result of Table 8.
[0076] (2) 160g of fruit-sugar grape-sugar liquid sugars and 0.5g of citric acids were dissolved in 90g water, 1g of this invention article 1 or the comparison article 1 was added in this solution, and the whole quantity was made into 1l. with aerated water. It capped after filling up a bottle, and sterilized for 20 minutes at 85 degrees C, and the carbonated drink was obtained. Standing preservation of the obtained carbonated drink was carried out for ten days at 60 degrees C, and condition observation was performed about the drink after preservation. The result is shown in Table 9. Each notation of front Naka expresses following semantics.
- R : generating of a neck ring is not accepted.
**R: Accept a neck ring slightly.
+ R : accept a clear neck ring.
+ +R : accept a remarkable neck ring.
[0077]
[Table 9]

試 料	60℃10日間保存後
	ネックリング
本発明品1	－R
比較品1	+R

[0078] Although generating of a neck ring was accepted by the drink which used the comparison article 1 so that clearly from the result of Table 9, generating of a neck ring was not accepted by the drink which used this invention article 1. Therefore, from this example 8, in using an emulsification constituent for a carbonated drink, it understands the particle diameter of the oil droplet that the smaller one is stable.
[0079] Example 9: The emulsification constituent was manufactured using the active ingredient shown in the stability following of an emulsification constituent content lactic acid bacteria beverage, the emulsifier, the antioxidant, and the hydrophilic medium. The lactic acid bacteria beverage was prepared using this emulsification constituent, and that stability was examined.
[0080]
Formula of an emulsification constituent: Content (%)
[Active ingredient]
Purification fish oil 50 (about 50% of DHA contents, about 15% of EPA contents)
[Emulsifier]
Deca glycerol mono-oleate 7 Cane-sugar monostearin acid ester 3 Zymolysis lecithin 0.5
[Antioxidant]
Sodium L-ascorbate 1 [Hydrophilic medium]
Glycerol 30 Water 8.5 Sum total 100 [0081] (An emulsification constituent, and the manufacture approach and the stability test approach of a lactic acid bacteria beverage) The emulsification constituent was manufactured by dissolving an antioxidant and an emulsifier in a hydrophilic medium, and emulsifying using a homogenizer, after adding an active ingredient subsequently to this and carrying out stirring distribution. The lactic acid bacteria beverages A and B of the following formula were prepared using this emulsification constituent.
Formula of a lactic acid bacteria beverage: Content (kg)
A B [Component **] Skimmilk powder 1 1 Lactic-acid-bacteria culture 1 1 Ion exchange water 20 20 [Component **]
Sugar 8 8 Skimmilk powder 2 2 Pectin 0.4 0.4 Citric acid 0.1 0.1 Emulsification constituent 1 Nothing Purification fish oil Nothing 0.5 (about 50% of DHA contents, about 15% of EPA contents) Perfume (yogurt flavor) 0.1 0.1 Water 66.4 66.9 Sum total 100100 [0082] Fermentation milk was prepared with the conventional method using component **, and stericooling was performed beforehand. The lactic acid bacteria beverage was prepared by adding this into the mixture of component ** and homogenizing with a homogenizer. After carrying out refrigeration preservation of the prepared lactic acid bacteria beverage for two weeks, ten panelists estimated the flavor. A result is shown in Table 10. The average in Table 10 is evaluation according to the flavor valuation basis shown in the example 7.
[0083]
[Table 10]

乳酸菌飲料	平均値
A	4.6
B	3.8

[0084] From Table 10, when the lactic acid bacteria beverage containing purification fish oil

makes the emulsification constituent of this invention contain shows that generating of **** is controlled.
[0085] Example 10: The emulsification constituent was manufactured using the active ingredient shown in the stability following of an emulsification constituent content pudding, the emulsifier, the antioxidant, and the hydrophilic medium. The pudding was prepared using this emulsification constituent and stability was examined.
[0086]
Formula of an emulsification constituent: Content (%)
[Active ingredient]
Purification fish oil 5 (about 5% of DHA contents, about 0.1% of EPA contents)
[Emulsifier]
Deca glycerol monostearin acid ester 3 Cane-sugar mono-oleate 1 [Antioxidant]
Sunflower seed extract 5 [Hydrophilic medium]
Glycerol 50 Water 36 Sum total 100 [0087] (An emulsification constituent, and the manufacture approach and the stability test approach of a pudding) The emulsification constituent was manufactured by the same approach as an example 9. The pudding of the following formula was prepared using this emulsification constituent.
Formula of a pudding: Content (kg)
All fat sweetened condensed milk 6 Skimmilk powder 5 Purification palm oil 4 Sugar 9 Sugar-added yolk 8 Gelling agent 0.5 Perfume 0.2 Emulsification constituent 0.5 Water 66.8 Sum total 100 [0088] Sterilization was performed for 10 minutes at 85 degrees C after dissolving the above-mentioned raw material. Subsequently, after homogenizing with a homogenizer, the pudding was prepared by filling up a container and cooling. The flavor was evaluated after saving the prepared pudding for two weeks at 7 degrees C. Consequently, there was no degradation of a flavor.
[0089] Example 11: The emulsification constituent was manufactured using the active ingredient shown in the stability following of an emulsification constituent content vienna sausage, the emulsifier, the antioxidant, and the hydrophilic medium. The vienna sausage was prepared using this emulsification constituent, and that stability was examined.
[0090]
Formula of an emulsification constituent: Content (%)
[Active ingredient]
Purification fish oil 10 (about 35% of DHA contents, about 10% of EPA contents)
[Emulsifier]
Deca glycerol monostearin acid ester 2 Deca glycerol mono-oleate 3 [Antioxidant]
Erythorbic acid 0.5 [Hydrophilic medium]
D-sorbitol 60 Water 24.5 Sum total 100 [0091] (An emulsification constituent, and the manufacture approach and the stability test approach of a vienna sausage) The emulsification constituent was manufactured by the same approach as an example 9. The vienna sausage of the following formula was prepared using this emulsification constituent.
Formula of a vienna sausage: [Component A] Content (kg)
Pig Woody meat 7 Lard 1 Iced water 2 10 [Component B]
Salt 150 Sodium nitrite 5 Polymerization sodium phosphate 50 Speiss mix 50 Sodium L-glutamate monohydrate 10 Sugar 20 sorbic acid potassium salt 20 Starch 300 Emulsification constituent 200 Sum total According to the conventional method, the ground was prepared using the 805 above-mentioned components A and B, sheep casing was filled up, after desiccation and a smoke, sterilization and cooling were performed and the vienna sausage was prepared.
[0092] It tried, after saving the prepared vienna sausage for two weeks in a refrigerator. Consequently, it has good flavor and **** was not sensed.
[0093] Example 12: The emulsification constituent was manufactured using the active ingredient shown in the stability following of emulsification constituent content soft drinks, an emulsifier, an antioxidant, a hydrophilic medium, and other oil solubility components. Soft drinks were prepared using this emulsification constituent, and that stability was examined.
[0094]

Formula of an emulsification constituent: Content (%)
[Active ingredient]
Purification fish oil 5 (about 35% of DHA contents, about 10% of EPA contents)
Oil solubility component] besides [
Beta carotene 0.5 Medium chain triglyceride 5 Orange oil 0.5 SAIB10 (shoe cloth acetate ISOBUCHIRETO) [Emulsifier]
Deca glycerol mono-oleate 6 Zymolysis lecithin 0.1 [Antioxidant]
L-ascorbic acid 0.5 [Hydrophilic medium]
Glycerol 50 Water 22.4 Sum total 100 [0095] (An emulsification constituent, and the manufacture approach and the stability test approach of soft drinks) The emulsification constituent was manufactured by dissolving an antioxidant and an emulsifier in a hydrophilic medium, and emulsifying using a homogenizer, after, adding the mixed solution which carried out the heating dissolution of an active ingredient and other oil solubility components subsequently to this and carrying out stirring distribution.
[0096] The soft drinks of the following formula were prepared using this emulsification constituent.
Formula of soft drinks: Content (kg)
Fruit-sugar grape-sugar liquid sugar 15 Orange transparence fruit juice (1/5 concentration) 0.2 L-ascorbic acid 0.1 Citric acid (crystal) 0.2 Sodium citrate 0.05 Orange flavor 0.1 Emulsification constituent 0.2 Water 84.15 Sum total 100 Soft drinks were prepared by sterilizing the above-mentioned raw material after mixing and the dissolution, and cooling.
[0097] The flavor was evaluated after saving the prepared soft drinks for three months at a room temperature. Consequently, **** was not sensed. Moreover, about the drink before and behind preservation, oil was extracted by n-hexane, respectively and POV (Peroxide Value) was measured. The result is shown in Table 11. The unit of POV is meq/kg among Table 11.
[0098]
[Table 11]

	POV
保存前	0.9
保存後	1.1

[0099] Even if it saved for three months at the room temperature so that clearly from Table 11, most rises of POV were not accepted.
[0100] Example 13: The emulsification constituent was manufactured using the active ingredient shown in the stability following of an emulsification constituent content hard candy, an emulsifier, an antioxidant, a hydrophilic medium, and other oil solubility components. The hard candy was prepared using this emulsification constituent, and that stability was examined.
[0101]
Formula of an emulsification constituent: Content (%)
[Active ingredient]
Purification fish oil 10 (about 25% of DHA contents, about 10% of EPA contents)
Oil solubility component] besides [
Gamma-linolenic acid oil (25% of gamma-linolenic acid contents) 10 [Emulsifier]
Deca glycerol palmitic-acid ester 6 Soybean lecithin 0.5 [Antioxidant]
Apple extract 1 Extract tocopherol 0.5 [Hydrophilic medium]
Glycerol 72 Sum total 100 [0102] (An emulsification constituent, and the manufacture approach and the stability test approach of a hard candy) After adding the mixed solution which was made to dissolve an antioxidant and an emulsifier in a hydrophilic medium, and was made to dissolve an active ingredient and other oil solubility components in it subsequently to this and carrying out stirring distribution, the emulsification constituent was manufactured by emulsifying using a homogenizer.
[0103] The hard candy of the following formula was prepared using this emulsification constituent.

Formula of a hard candy: Content (kg)
Sugar 60 Starch syrup 40 Citric acid (crystal) 0.7 L-ascorbic acid 0.05 Coloring matter 0.05 Perfume 0.3 Emulsification constituent 0.4 Water 20 Sum total 100 According to the conventional method, the hard candy was prepared using the above-mentioned raw material.
[0104] The flavor was evaluated after saving the prepared hard candy for three months at a room temperature. Consequently, **** was not sensed.
[0105]
[Effect of the Invention] To oxidation, the emulsification constituent of this invention is stable, and does not have generating of an odor, is a stable emulsification constituent which contains the natural oil of the derivative of DHA(s) and EPA in which prolonged preservation is possible, or these acids which contains a kind or these at least as an active ingredient, and can be used suitable for various food, such as a drink, frozen desert, confectionery, dairy products, a bakery product, and a water zootechnics processed food.
[0106] The stable food containing the derivative of DHA, EPA, or these acids can be offered without spoiling the properties (for example, a configuration, a smell, the taste, a **** rate, a color tone, etc.) of the food itself, if the emulsification constituent of this invention is used. Moreover, according to the emulsification constituent of this invention, also when it adds for the aquosity food of what kind of specific gravity, generating of a neck ring or precipitate can be prevented.

[Translation done.]

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TECHNICAL FIELD

[Industrial Application] This invention relates to the stable emulsification constituent about the natural oil of the derivative of docosa-hexaenoic acid, eicosapentaenoic acid, and these acids which contains a kind or them at least. The emulsification constituent of this invention is desirable although it is used for various food, for example, a drink, frozen desert, confectionery, dairy products, a bakery product, a water zootechnics processed food, etc.

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EFFECT OF THE INVENTION

[Effect of the Invention] To oxidation, the emulsification constituent of this invention is stable, and does not have generating of an odor, is a stable emulsification constituent which contains the natural oil of the derivative of DHA(s) and EPA in which prolonged preservation is possible, or these acids which contains a kind or these at least as an active ingredient, and can be used suitable for various food, such as a drink, frozen desert, confectionery, dairy products, a bakery product, and a water zootechnics processed food.
[0106] The stable food containing the derivative of DHA, EPA, or these acids can be offered without spoiling the properties (for example, a configuration, a smell, the taste, a **** rate, a color tone, etc.) of the food itself, if the emulsification constituent of this invention is used. Moreover, according to the emulsification constituent of this invention, also when it adds for the aquosity food of what kind of specific gravity, generating of a neck ring or precipitate can be prevented.

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TECHNICAL PROBLEM

[Description of the Prior Art] It is the straight chain higher unsaturated fatty acid that in fish oil mainly contained, and having bioactive, such as a blood cholesterol level fall operation, a ** gun operation, an anti-thrombus operation, and an improvement operation in study ability, is reported, and docosa-hexaenoic acid (Following DHA is called) and eicosapentaenoic acid (Following EPA is called) are one of the food materials which attract attention most now. [many]
[0003] However, since EPA has five double bonds in 1 molecule and DHA has six double bonds in 1 molecule, receiving oxidation very easily and coming to generate a return fish (****) peculiar to fish oil according to slight oxygen, heat, light, an oxidation catalyst, etc., is known. In using the fish oil containing such a straight chain higher unsaturated fatty acid, in order to prevent antioxidizing or generating of ****, various kinds of techniques are proposed.
[0004] For example, the approach (JP,6-49479,A) of stabilizing omega-3 unsaturated fatty acid with emulsifiers, such as the margarine (JP,2-203741,A) and Tween 20 which distributed the capsule which added a tocopherol and/or lecithin to the fish oil addition milk powder (JP,4-346749,A) and the higher unsaturated fatty acid which blended vitamin C and/or its salt, and was covered with edible coating, sucrose fatty acid ester, a sorbitan fatty acid ester, and lecithin, etc. is learned.
[0005] However, not to acquire the effectiveness may be satisfied with any case of effectiveness, but to obtain a more stable emulsification constituent is desired. Then, this invention persons came to complete a header and this invention for the ability of a stable emulsification constituent to be obtained by using a specific emulsifier and using polyhydric alcohol or water polyhydric alcohol as a hydrophilic medium, as a result of examining wholeheartedly how to make stability distribute DHA, EPA, etc. in a hydrophilic medium.

[Translation done.]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

MEANS

[Means for Solving the Problem] This invention The natural oil of the derivative of the docosa-hexaenoic acid as an active ingredient, eicosapentaenoic acid, and these acids which contains a kind or them at least, The emulsifier of sufficient amount to be able to emulsify an active ingredient at least, and an antioxidant, They are independent or this, sucrose fatty acid ester (carbon numbers 12-20 of a fatty acid), and/or lecithin. from a hydrophilic medium -- becoming -- an emulsifier -- ten or more HLB polyglyceryl fatty acid ester (carbon numbers 12-20 of a fatty acid) -- And the stable emulsification constituent whose hydrophilic medium is polyhydric alcohol or water polyhydric alcohol, and the food containing it are offered.
[0007] The emulsification constituent of this invention is an emulsification constituent with which the natural oil containing the derivative of DHA, EPA, or these acids or them was made into the active ingredient, and these active ingredients were distributed by homogeneity and homogeneity in the hydrophilic medium as an oil droplet. the emulsification constituent of this invention -- setting -- as an emulsifier -- ten or more HLB polyglyceryl fatty acid ester (carbon numbers 12-20 of a fatty acid) -- it is indispensable independent or in order for using polyhydric alcohol or water polyhydric alcohol as a hydrophilic medium to make stability hold using mixture with this, sucrose fatty acid ester (carbon numbers 12-20 of a fatty acid), and/or lecithin.
[0008] Hereafter, each component in the emulsification constituent of this invention is explained to a detail. The derivatives (hereafter, the derivative of DHA, EPA, and these acids is synthesized, and an active ingredient is called) of DHA as an active ingredient in the emulsification constituent of this invention, EPA, and these acids may be any of synthetic compounds or a natural article, and may be the gestalt of the natural oil containing these acids. What is manufactured by a microorganism besides a chemical composition etc. is included by synthetic compounds. A natural article means that by which extract purification was carried out from the natural oil containing the derivative of DHA, EPA, or these acids by approaches, such as a well-known approach, for example, squeezing, solvent extraction, steam distillation, molecular distillation, supercritical fluid extraction, and a column chromatography. A pure article or a crude material is sufficient as the active ingredient in this invention.
[0009] The natural oil used for this invention means the oil of the natural product origin containing the derivative of DHA, EPA, or these acids. Especially the natural oil used in this invention is not limited, but the thing originating in all the origins of seaweed, a microorganism, an animal, vegetation, etc. can be used for it. As a desirable example of natural oil, fish oil (for example, a cuttlefish oil, sardine oil, a krill oil, a bonito oil, the Sabah oil, a salmon oil, a Pacific saury oil, a tare an oil, a tuna oil, etc.), a yolk oil, the oil of the algae origin, etc. are mentioned, and fish oil and the oil of the algae origin are more desirable. Moreover, what condensed the above natural oil by what was given to various processings (for example, deordorization processing by the bleaching processing by the deoxidation processing by alkali, such as degumming processing by phosphating etc. and caustic alkali of sodium, etc., the activated clay, etc., steam distillation, etc.), judgment, fractionation, enzyme processing, etc. is included by the natural oil in this invention.
[0010] As for the derivative of DHA or EPA used in this invention, what does so at least the bioactive which DHA or EPA has is desirable, and all the derivatives in which such bioactive is

shown are included in this invention. As an example of the derivative of DHA or EPA, a salt, an amide, phospholipid, a monoglyceride, diglyceride, ester (for example, methyl ester, ethyl ester, propyl ester, cane-sugar ester, etc.), etc. are mentioned, and a monoglyceride, diglyceride, and ethyl ester are desirable in these.

[0011] Generally the content of the active ingredient in the emulsification constituent of this invention is 0.0001 - 50 % of the weight, and is 0.1 - 25 % of the weight preferably. The content of such an active ingredient is suitably chosen in consideration of the use application of an emulsification constituent, the purification purity of an active ingredient, the content of the active ingredient in natural oil, the enrichment of the natural oil containing an active ingredient, etc. For example, when an active ingredient is a pure article, in consideration of the bioactive strength, it can also consider as low concentration like about 0.0001 - 0.1 % of the weight, and when stronger activity is desired, in consideration of impure oil not existing, it can also consider as high concentration like about 0.1 - 50 % of the weight. Moreover, if this natural oil is condensed when an active ingredient is the gestalt of natural oil, since it can also consider as low concentration since the bioactive becomes strong, and impure oil decreases on the other hand, it can also consider as high concentration.

[0012] In this invention, it is ten or more HLB as an emulsifier, and the polyglyceryl fatty acid ester of 12-20 is used for the carbon number of a fatty acid at least. Such polyglyceryl fatty acid ester has [especially / other emulsifiers] the high emulsion stability under acidity, and the natural oil containing the derivative of DHA, EPA, and these acids and them can be maintained at stability under acidity for a long period of time. Polyglyceryl fatty acid ester is independent, or can be used by request as the mixture of this and sucrose fatty acid ester, the mixture of this and lecithin, and mixture of this, sucrose fatty acid ester, and lecithin. Sucrose fatty acid ester and lecithin act auxiliary to stabilization of emulsification. For example, when using the emulsification constituent of this invention for a drink etc., it is desirable to use mixture with polyglyceryl fatty acid ester, sucrose fatty acid ester, and/or lecithin as an emulsifier.

[0013] In addition, since lecithin generally cannot melt into water easily when using lecithin as an emulsifier, it is desirable to make it dissolve in edible oil and fat (example: coconut oil, gamma-linolenic acid oil, etc.) beforehand, and to use. The amounts of the edible oil and fat used in that case are about 1:1 - 1:20 (weight ratio) to lecithin. The emulsifier in this invention is used in sufficient amount to be able to emulsify an active ingredient in an emulsification constituent at least. The oil droplet whose sufficient amount to be able to emulsify an active ingredient is a dispersed phase means sufficient amount for homogeneity and homogeneity to distribute in a hydrophilic medium. Generally, the content in the emulsification constituent of an emulsifier is about 0.01 - 20 % of the weight, and its about 0.5 - 10 % of the weight is desirable. In consideration of the content of an active ingredient etc., the content of this emulsifier is said within the limits, and is chosen suitably. Generally, as for the rate of an emulsifier to an active ingredient, 1:0.1-1:1 (weight ratio) is desirable.

[0014] Moreover, although various kinds of additives which contain the above-mentioned edible oil and fat (solvent of lecithin) and an oil solubility component like the after-mentioned in the emulsification constituent of this invention may be added, the content of an emulsifier can be made to increase depending on such a class and the amount of the additive used. However, generally the content of an emulsifier is enough within the limits of the above. As an emulsifier in this invention, when mixture with polyglyceryl fatty acid ester, sucrose fatty acid ester, and/or lecithin is used, it is desirable to use mixture with which the rate of the polyglyceryl fatty acid ester in the mixture becomes at least 50 % of the weight. As for the mixing ratio of polyglyceryl fatty acid ester and sucrose fatty acid ester, abbreviation 1:0.05-1:1 (weight ratio) is desirable, and, as for the mixing ratio of polyglyceryl fatty acid ester and lecithin, specifically, about 1:0.005 to 1:0.5 (weight ratio) is desirable. Moreover, as for the mixing ratio of polyglyceryl fatty acid ester, sucrose fatty acid ester, and lecithin, about 1:0.05:0.005 to 1:1:0.5 (weight ratio) is desirable.

[0015] the polyglyceryl fatty acid ester used in this invention -- being related -- HLB -- ten or more -- desirable -- 12-20 -- more -- desirable -- 13-16 -- further -- more -- desirable -- 14-16 -- it is -- the carbon number of a fatty acid -- 12 or more -- desirable -- 12-20 -- it is

14-18 more preferably. Moreover, as for the average degree of polymerization of a glycerol, 6-15 are desirable, and 8-10 are more desirable. As a desirable example of polyglyceryl fatty acid ester, hexa glycerol monostearin acid ester, deca glycerol monostearin acid ester, deca glycerol mono-oleate, deca glycerol mono-myristic-acid ester, deca glycerol mono-palmitic-acid ester, etc. are mentioned, and deca glycerol monostearin acid ester, deca glycerol mono-oleate, and especially deca glycerol mono-palmitic-acid ester are desirable in them. independent [in these polyglyceryl fatty acid ester] in this invention -- or it can mix and use.

[0016] As a content in the emulsification constituent of polyglyceryl fatty acid ester, about 0.01 - 20 % of the weight is desirable, and especially about 0.2 - 10 % of the weight is desirable. In consideration of the amount of the content of an active ingredient, the sucrose fatty acid ester described below, and the lecithin used etc., the content of polyglyceryl fatty acid ester is said within the limits, and is chosen suitably. It is ten or more HLB, and 12 or more things have the desirable carbon number of a fatty acid, and the sucrose fatty acid ester used in this invention has the more desirable thing of 12-20. As a desirable example of sucrose fatty acid ester, cane-sugar monostearin acid ester, cane-sugar mono-oleate, cane-sugar mono-palmitic-acid ester, etc. are mentioned. independent [in these sucrose fatty acid ester] in this invention -- or it can mix and use.

[0017] As a content in the emulsification constituent of sucrose fatty acid ester, about 0.1 - 5 % of the weight is desirable. In consideration of the content of an active ingredient, the amount of the polyglyceryl fatty acid ester used, the amount of the lecithin used described below, etc., the content of sucrose fatty acid ester is said within the limits, and is chosen suitably. The lecithin used in this invention means phospholipid, such as phosphatidylcholine, phosphatidylethanolamine, phosphatidylinositol, phosphatidic acid, phosphatidylserine, and sphingomyelin, in this invention, these components are named generically and lecithin is called.

[0018] As lecithin used in this invention, the thing originating in all the origins, such as an animal, vegetation, yeast, and mold, can be used. As a desirable example of the lecithin used in this invention, vegetable lecithin (for example, a soybean lecithin, cone lecithin, rapeseed lecithin, etc.), yolk lecithin, judgment lecithin, zymolysis lecithin, etc. are mentioned, and a soybean lecithin, yolk lecithin, and zymolysis lecithin are more desirable in these. independent [in these lecithin] in this invention -- or it can mix and use.

[0019] Judgment lecithin means what carried out fractionation of the specific component using the difference of solubility from vegetable lecithin or yolk lecithin using organic solvents, such as ethanol. Zymolysis lecithin makes phospholipase act on vegetable lecithin, yolk lecithin, judgment lecithin, etc., and means what is obtained by making hydrolysis, a transition reaction, etc. perform. Although various things are obtained according to the class of lecithin, or the class of phospholipase, in this invention, zymolysis lecithin synthesizes these and calls them zymolysis lecithin. Any zymolysis lecithin of a class can be used in this invention.

[0020] As a content in the emulsification constituent of lecithin, about 0.001 - 2 % of the weight is desirable. In consideration of the amount of the content of an active ingredient, polyglyceryl fatty acid ester, and the sucrose fatty acid ester used etc., the content of lecithin is said within the limits, and is chosen suitably. In this invention, polyhydric alcohol or water polyhydric alcohol is used as a hydrophilic medium. If these hydrophilic media are used, compared with the case where it carries out through a water independent, generating of **** can be prevented more, and an emulsification constituent with high preservation stability can be obtained. Moreover, if these hydrophilic media are used, compared with the case where it carries out through a water independent, it is the same energy, and especially when the small emulsification constituent of the particle diameter of an oil droplet can be obtained more, for example, a small emulsification constituent of the particle diameter of an oil droplet like soft drinks is desired, it is advantageous.

[0021] The water content of the water polyhydric alcohol used in this invention has about 50 or less desirable % of the weight, and its about 30 or less % of the weight is more desirable. As a desirable example of polyhydric alcohol, a glycerol, a sorbitol, propylene glycol, etc. are mentioned and a glycerol and a sorbitol are more desirable in these. As a desirable example of water polyhydric alcohol, glycerol water, about 50 - 70-% of the weight sorbitol water, etc. are

mentioned about 60 to 90% of the weight.
[0022] As a desirable example of the antioxidant used in this invention An ascorbic acid, isoascorbic acid or those salts (for example, an alkali-metal salt, an alkaline-earth-metal salt, etc.), catechins, a catechins content natural extract, etc. are mentioned. Specifically L-ascorbic acid, sodium L-ascorbate, erythorbic acid, Ascorbic acids, such as sodium erythorbate; GAROKATEKIN, epigallocatechin, Catechins, such as epicatechin, epigallocatechin gallate, and epicatechin gallate; A tea extract, Catechins content natural extracts, such as an apple extract, a grape seed extract, a sunflower seed extract, and a rice bran extract, etc. are mentioned, and L-ascorbic acid, sodium L-ascorbate, and a tea extract are desirable in these. These antioxidants can be used with one sort or two sorts or more of mixture.
[0023] The above-mentioned catechins content natural extract can extract the leaf of tea (example: green tea, oolong tea, tea, roasted tea, etc.), apple pulp, a grape seed, a sunflower seed, etc. with organic solvents, such as water, and ethanol, chloroform, and can refine and obtain them by the well-known approach. A pure article or a crude material is sufficient as the catechins content natural extract used in this invention.
[0024] Moreover, well-known antioxidants, such as tocopherols (example: an extract tocopherol, dl-alpha-tocopherol, etc.), polyphenol (example: rutin, myricetin, myricitrin, etc.), spice extracts (example: a rosemary, SAGE, etc.), acids (example: chlorogenic acid, caffeic acid, ferulic acid, gallic acid, etc.) of the natural product origin, dibutylhydroxytoluene (BHT), and burylhydroxyanisole (BHA), can be made to use together in addition to the above-mentioned antioxidant. When these antioxidants can also be used with one sort or two sorts or more of mixture and use together these antioxidants and the above-mentioned antioxidant, it is effective with prevention of an after-tack smell peculiar to ****.
[0025] Preferably [using it for consuming the dissolved oxygen in an emulsification constituent more than a complement], and generally, the antioxidant of this invention is 0.001 - 20 % of the weight, and is 0.01 - 20 % of the weight preferably. According to the class of unsaturated fatty acid in an active ingredient or its content, the purity of an active ingredient, the class of antioxidant, the amount of dissolved oxygen in an emulsification constituent, etc., the amount of this antioxidant used is within the limits, and is changed [above-mentioned]. Moreover, when some kinds of antioxidants are used in this invention, according to the class of the antioxidant, the purpose of using an emulsification constituent, etc., the amount of each antioxidant used is above-mentioned within the limits, and is determined suitably.
[0026] The emulsification constituent of this invention may be made to contain other additives by request in order to raise the emulsifiability of an emulsification constituent, thermal resistance, acid resistance, preservation stability, the emulsion stability in the inside of food, etc. As long as it is not the matter which promotes oxidation of the derivative of DHA, EPA, or these acids as such an additive, either of a well-known food additive can be used and a water-soluble thing is sufficient also as an oil solubility thing. As an example of such an additive, giant-molecule polysaccharide, preservatives (example: soluble starch, a dextrin, cyclodextrin, gum arabic, pectin, xanthan gum, etc.) (example: p-hydroxybenzoic esters, benzoic acid, etc.), a specific-gravity-adjustment agent [SAIB (shoe cloth acetate ISOBUCHIRETO)], a proteolysis object, vitamins (example: casein, gelatin, etc.), coloring matter (example: alpha-carotene, beta carotene, lycopene, etc.), perfume, unsaturated fatty acid (example: alpha-linolenic acid, gamma-linolenic acid, linolic acid, etc.) etc. be mentioned. The amount of these additives used is suitably determined according to the purpose of use.
[0027] As for the emulsification constituent of this invention, it is desirable that the particle diameter of the oil droplet in an emulsification constituent sets 0.25 micrometers or less to 0.2 micrometers or less preferably according to a use application. By doing so, the muddiness produced when it is used to aquosity food like soft drinks, and a neck ring (what the particle of the oil droplet in an emulsification constituent surfaced on the drink front face according to the specific gravity difference, and gathered is called) and precipitate can be prevented, and stable food can be obtained, without performing specific gravity adjustment. Moreover, since a specific-gravity-adjustment agent (SAIB) is not used in that case, an emulsification constituent can be manufactured, without performing no heating actuation in a manufacture process.

[0028] The emulsification constituent of this invention can carry out the mixed dissolution of each of water-soluble materials and an oil solubility component separately beforehand, and can manufacture it by adding oil solubility component mixture to the water-soluble-materials mixture, and distributing homogeneity and homogeneity. It is desirable to use emulsifiers, such as a colloid mill, a homomixer, and a high-pressure homogenizer, in the case of the emulsification constituent adjustment, and it is desirable to stop the heat generated in the case of emulsification with a cooling system etc.
[0029] Thus, to oxidation, the obtained emulsification constituent is stable, and does not have generating of an odor, and prolonged preservation is possible for it and it is used suitable for various food, such as a drink, frozen desert, confectionery, dairy products, a bakery product, and a water zootechnics processed food. Without spoiling the properties (for example, a configuration, a smell, the taste, a **** rate, a color tone, etc.) of the food itself, the food containing the emulsification constituent of this invention is the food which the derivative of DHA, EPA, or these acids contained, and produces neither a neck ring nor precipitate.
[0030] The emulsification constituent of this invention can be used for various kinds of food as a food additive, and a liquid, the shape of a half-solid, and solid any are sufficient as food. The following are mentioned as the example.
Drink: A carbonated drink, a fruits drink, the drink made from milk, a vegetable drink, soybean milk, etc.
Frozen desert: Ice cream, a Popsicle, sherbet, etc.
Confectionery: Jelly, a candy, gum, Cookie, a cake, chocolate, a pie, a biscuit, a pudding, etc.
Dairy products: Cow's milk, yogurt, a cheese head, butter, margarine, mayonnaise, salad dressing, etc.
Bakery product: In addition to this, they are :animal feed, drugs, quasi drugs, etc., such as cooking article:omelets, such as seasoning:bean paste, such as water zootechnics processed food:hums, such as pans, noodles, and a pasta, a sausage, boiled fish paste, and a fishcake tube, dripping, and the source, an omelet, Calais, a stew, a hamburger, a croquette, soup, an as-you-like-it pancake, and a Chinese meat dumpling, [0031]. About the amount of the emulsification constituent used of this invention to the above food, it is added so that the content in the food of the natural oil containing the derivative of DHA(s) and EPA which are generally an active ingredient, or these acids, or them may become about 0.0001 - 1 % of the weight, and it is added so that it may become about 0.001 - 0.1 % of the weight preferably.
[0032] The emulsification constituent in this invention can be used for various food using a well-known approach. Although an example is shown and this invention is explained still more concretely hereafter, this invention is not limited to these. In addition, in the following examples, especially % expresses weight %, unless it is shown.

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EXAMPLE

[Example] Example 1: The emulsification constituent was manufactured using the active ingredient shown below, the antioxidant, and the hydrophilic medium, using the polyglyceryl fatty acid ester shown in Table 1 as an effect emulsifier by the class of polyglyceryl fatty acid ester, and the stability was examined.
[0034]
Formula of an emulsification constituent: Content (%)
[Active ingredient]
Purification fish oil 20 (about 25% of DHA contents, about 10% of EPA contents)
[Emulsifier]
Polyglyceryl fatty acid ester (refer to Table 1) 5 [Antioxidant]
L-ascorbic acid 0.5 [Hydrophilic medium]
Water 24.5 Glycerol 50 The sum total The emulsification constituent was manufactured by dissolving a glycerol, polyglyceryl fatty acid ester, and L-ascorbic acid in 100 (the manufacture approach and the soundness test approach of an emulsification constituent) water, and emulsifying using a homogenizer, after adding purification fish oil subsequently to this and carrying out stirring distribution. That condition was observed after leaving this emulsification constituent for one week at a room temperature or 60 degrees C. A result is shown in Table 1. O shows the condition that, as for x, the emulsification constituent has divided those without abnormalities into the bilayer, among Table 1.
[0035]
[Table 1]

ポリグリセリン 脂肪酸エステル	グリセリン 平均縮重合度	脂肪酸	HLB	1週間放置後の乳化組成物の状態 室温	60℃
テトラグリセリンモノステアリン 酸エステル	4	18:0	10	×	×
ヘキサグリセリンモノステアリン 酸エステル	6	18:0	12	○	×
デカグリセリンモノステアリン酸エステル	10	18:0	14	○	○
デカグリセリントリステアリン酸エステル	10	18:0	9	×	×
オクタグリセリンモノオレイン酸エステル	8	18:1	13	○	○
デカグリセリンモノオレイン 酸エステル	10	18:1	14	○	○
デカグリセリンモノミリスチン酸エステル	10	14:0	15	○	○
デカグリセリンモノラウリン 酸エステル	10	12:0	16	○	×
デカグリセリンモノカプリル 酸エステル	10	8:0	16	×	×

[0036] It is clear from Table 1 to have the effectiveness HLB excelled [effectiveness] in 13 or more and glycerol average degree of polymerization, and the carbon number of 8 or more and a fatty acid excelled [effectiveness] in 14 or more polyglyceryl fatty acid ester.
[0037] Example 2: Using the active ingredient shown in the effect following by the addition of polyglyceryl fatty acid ester, the emulsifier, the antioxidant, and the hydrophilic medium, as shown in Table 2, various contents of an active ingredient and an emulsifier were changed, the emulsification constituent was manufactured, and the stability was examined.
[0038]
Formula of an emulsification constituent: Content (%)
[Active ingredient]
Purification fish oil Refer to Table 2. (about 25% of DHA contents, about 10% of EPA contents)
[Emulsifier]
Deca glycerol mono-oleate Refer to Table 2. [Antioxidant]
L-ascorbic acid 0.5 [Hydrophilic medium]
Glycerol 40 Water Residue Sum total 100 [0039] (The manufacture approach and the soundness test approach of an emulsification constituent) The emulsification constituent was manufactured by dissolving glycerol and deca glycerol mono-oleate and L-ascorbic acid in water, and emulsifying using a homogenizer, after adding purification fish oil subsequently to this and carrying out stirring distribution. That condition was observed after leaving this emulsification constituent for one week at a room temperature. A result is shown in Table 2. O shows the condition that, as for x, the emulsification constituent has divided those without abnormalities into the bilayer, among Table 2.
[0040]
[Table 2]

精製魚油(%)	ポリグリセリンモノオレイン酸エステル	状態
1	0.1	○
10	0.1	×
40	0.1	×
1	2	○
10	2	○
40	2	○
1	10	○
10	10	○
40	10	○

[0041] When purification fish oil (about 25% of DHA contents, about 10% of EPA contents) is used as an active ingredient and polyglyceryl fatty acid ester is added so that the rate of polyglyceryl fatty acid ester to an active ingredient may become more than 1:0.05 (40:2), it is clear from Table 2 to have the outstanding effectiveness.
[0042] Example 3: The emulsification constituent was manufactured using the hydrophilic medium (glycerol water) or water shown in the effect following by the water content of a hydrophilic medium, and an active ingredient, an emulsifier and an antioxidant, and the stability was examined.
[0043]
Formula of an emulsification constituent: Content (%)
[Active ingredient]
Purification fish oil 20 20 20 20 (about 25% of DHA contents, about 10% of EPA contents)

[Emulsifier]
Deca glycerol mono-oleate 5 5 5 5 [Antioxidant]
Ascorbic acid 1 1 1 1 [Hydrophilic medium]
A glycerol - 30 52 74 Water 74 44 22 - Sum total 100 100 100 100 Hydrophilic medium water content (%) 100 60 300 [0044] (The manufacture approach and the soundness test approach of an emulsification constituent) The emulsification constituent was manufactured by dissolving deca glycerol mono-oleate and an ascorbic acid in the above-mentioned hydrophilic medium, and emulsifying using a homogenizer, after adding purification fish oil subsequently to this and carrying out stirring distribution. This emulsification constituent was diluted with ion exchange water 1000 times, and that flavor was evaluated. Moreover, the particle diameter of the oil droplet in an emulsification constituent was measured. the particle diameter of an oil droplet -- laser -- it measured using] by diffraction type particle-size-distribution meter SALD-110 [Shimadzu Corp. Furthermore, after saving this emulsification constituent for two weeks at 40 degrees C, it diluted with ion exchange water 1000 times similarly, that flavor was evaluated, and the particle diameter of the oil droplet in an emulsification constituent was measured.
[0045] These results are shown in Table 3. The notation in Table 3 shows evaluation according to the following flavor valuation basis.
Flavor valuation basis: -; **** is not sensed.
+; **** is sensed small.
+ +; **** is sensed.
+ ++; **** is sensed strong.
[0046]
[Table 3]

親水性媒体含水率 (重量%)	製造直後		42℃, 2週間保存後	
	香味評価	油滴の粒子径 (μm)	香味評価	油滴の粒子径 (μm)
100	++	0.86	+++	1.1
60	+	0.52	++	0.70
30	-	0.24	-	0.25
0	-	0.23	-	0.23

[0047] The emulsification constituent manufactured using the hydrophilic medium which has about 30% or less of water content showed the preservation stability which generating of **** was prevented and was excellent compared with the emulsification constituent manufactured using the hydrophilic medium with high water independent and water content so that clearly from Table 3. Moreover, the small emulsification constituent of the particle diameter of an oil droplet was obtained, so that the medium with low water content was used.
[0048] Example 4: The emulsification constituent was manufactured using the antioxidant shown in the effect table 4 by the class of antioxidant, the active ingredient shown in the following and an emulsifier, and the hydrophilic medium, and the stability was examined.
[0049]
Formula of an emulsification constituent: Content (%)
[Active ingredient]
Purification fish oil 20 (about 25% of DHA contents, about 10% of EPA contents)
[Emulsifier]
Deca glycerol monostearin acid ester 5 [Antioxidant]
Refer to Table 4. 1 [Hydrophilic medium]
Water 24 Glycerol 50 Sum total 100 [0050] (The manufacture approach and the soundness test approach of an emulsification constituent) The emulsification constituent was manufactured by dissolving a glycerol, deca glycerol monostearin acid ester, and an anti-oxidant in water, and emulsifying using a homogenizer, after adding purification fish oil subsequently to this and carrying out stirring distribution. However, among the anti-oxidants in Table 4, it was made to dissolve in purification fish oil, and an extract tocopherol and L-ascorbic acid palmitic-acid ester manufactured the emulsification constituent. After saving this emulsification constituent for one

week at 40 degrees C, it diluted with ion exchange water 1000 times, and that flavor was evaluated. A result is shown in Table 4. The notation in Table 4 shows evaluation according to the above-mentioned flavor valuation basis.
[0051]
[Table 4]

酸化防止剤	香味評価
ブランク	+++
L-アスコルビン酸	-
L-アスコルビン酸ナトリウム	-
エリソルビン酸	-
茶抽出物	-
リンゴ 抽出物	-
ブドウ 種子抽出物	-
ひまわり種子抽出物	-
没食子酸	+
抽出トコフェロール	++
L-アスコルビン酸パルミチン 酸エステル	++

[0052] It is clear from Table 4 that L-ascorbic acid, sodium L-ascorbate, erythorbic acid, a tea extract, an apple extract, a grape seed extract, and a sunflower seed extract have the outstanding antioxidizing effectiveness.
[0053] Example 5: Using the active ingredient shown in the effect following by the addition of an antioxidant, the emulsifier, the antioxidant, and the hydrophilic medium, as shown in Table 5, various contents of an antioxidant were changed, the emulsification constituent was manufactured, and the stability was examined.
[0054]
Formula of an emulsification constituent: Content (%)
Purification fish oil 20 (about 25% of DHA contents, about 10% of EPA contents)
[Emulsifier]
Deca glycerol monostearin acid ester 5 [Antioxidant]
L-ascorbic acid Refer to Table 5. Tea extract Refer to Table 5. [Hydrophilic medium]
Glycerol 50 Water Residue Sum total 100 [0055] (The manufacture approach and the soundness test approach of an emulsification constituent) The emulsification constituent was manufactured by dissolving a glycerol, deca glycerol monostearin acid ester, and an anti-oxidant (L-ascorbic acid or tea extract) in water, and emulsifying using a homogenizer, after adding purification fish oil subsequently to this and carrying out stirring distribution. After saving this emulsification constituent for one week at 40 degrees C, it diluted with ion exchange water 1000 times, and that flavor was evaluated. A result is shown in Table 5. The notation in Table 5 shows evaluation according to the above-mentioned flavor valuation basis.
[0056]
[Table 5]

L-アスコルビン酸(%)	茶抽出物(%)	香味評価
-	-	+++
0.001	-	++
0.1	-	+
1	-	-
5	-	-
-	1	+
-	20	-

[0057] L-ascorbic acid shows the antioxidizing effectiveness by 0.001% or more of addition, and Table 5 shows that a tea extract shows the antioxidizing effectiveness by 1% or more of addition, when purification fish oil (about 25% of DHA contents, about 10% of EPA contents) is used as an active ingredient. An antioxidant is considered that the antioxidizing effectiveness is demonstrated by the addition more than a complement although the dissolved oxygen in an emulsification constituent is consumed.
[0058] Example 6: As an effect emulsifier by the class of emulsifier, using mixture with the emulsifier shown in deca glycerol monostearin acid ester and Table 6, the emulsification constituent was manufactured using the active ingredient shown below, the antioxidant, and the hydrophilic medium, and the stability in the carbonated drink was examined.
[0059]
Formula of an emulsification constituent: Content (%)
[Active ingredient]
Purification fish oil 20 (about 25% of DHA contents, about 10% of EPA contents)
[Emulsifier]
deca glycerol monostearin acid ester 5 others -- emulsifier (refer to Table 6) 0.5 [Antioxidant]
L-ascorbic acid 0.5 [Hydrophilic medium]
Water 24 Glycerol 50 Sum total 100 [0060] (An emulsification constituent, and the manufacture approach and the stability test approach of a carbonated drink) The emulsification constituent was manufactured by dissolving in water the emulsifier and L-ascorbic acid which are shown in a glycerol, polyglyceryl fatty acid ester, and Table 6, and emulsifying using a homogenizer, after adding purification fish oil subsequently to this and carrying out stirring distribution. The carbonated drink was prepared by creating the carbonated drink syrup of the following formulas, adding aerated water to this syrup 50g using this emulsification constituent, and preparing to 200ml. After putting this carbonated drink for one month at a room temperature, the condition (existence of neck ring generation) of a carbonated drink was observed. A result is shown in Table 6. The notation in Table 6 shows evaluation according to the following valuation basis.
[0061] Valuation basis: -; the neck ring is not generated.
+; the neck ring is generated slightly.
+ +; the neck ring is generated.
+ ++; the neck ring is generated so much.
Formula of carbonic acid bevel-use syrup: Fruit-sugar grape-sugar liquid sugar (Brix 75 **) 26g Citric acid 0.4g L-ascorbic acid 0.1g Emulsification constituent 0.2g Ion exchange water 23.3g Sum total 50g [0062]
[Table 6]

他の乳化剤	ネックリングの生成
無添加	+
グリセリンモノオレイン酸エステル	++
ショ糖モノオレイン酸エステル	−
ソルビタンモノオレイン酸エステル	+
大豆レシチン	−
酵素分解レシチン	−

[0063] It turns out that it has the effectiveness which was excellent from Table 6 compared with the time of using the mixture of a deca glycerol monostearin acid ester independent, and deca glycerol monostearin acid ester and glycerol mono-oleate, and the mixture of deca glycerol monostearin acid ester and sorbitan monooleate ether when an emulsification constituent was used for a carbonated drink, and the mixture of deca glycerol monostearin acid ester and cane-sugar mono-oleate or the mixture of deca glycerol monostearin acid ester and lecithin was used as an emulsifier.
[0064] Example 7: The emulsification constituent (emulsification constituent A) containing an antioxidant and the emulsification constituent (emulsification constituent B) which does not contain an antioxidant were manufactured using the active ingredient shown in the effect following by the existence of an antioxidant, the emulsifier, the antioxidant, and the hydrophilic medium. Yogurt was prepared using these emulsification constituents A and B, and those stability was examined.
[0065]
Formula of an emulsification constituent: Content (%)
A B [Active ingredient]
Purification fish oil 20 20 (about 25% of DHA contents, about 10% of EPA contents)
[Emulsifier]
Deca glycerol mono-oleate 2 2 Cane-sugar monostearin acid ester 1 1 [Antioxidant]
Tea extract Nothing 3 [Hydrophilic medium]
Water 37 34 Glycerol 40 40 Sum total 100 100 [0066] (An emulsification constituent, and the manufacture approach and the stability test approach of yogurt) The emulsification constituents A and B were manufactured by dissolving a glycerol, an emulsifier, and an antioxidant (an antioxidant being added only when manufacturing the emulsification constituent B) in water, and emulsifying using a homogenizer, after adding purification fish oil subsequently to this and carrying out stirring distribution. The yogurt of the following formulas was prepared using these emulsification constituents A and B. 1% of lactic-acid-bacteria cultures was added after sterilization and cooling, and the transparence cup made from polyethylene was filled up with this yogurt, and it was cultivated at 28 degrees C for 20 hours. Subsequently, evaluation of a flavor was performed after performing a fluorescent lamp exposure (2000lux, one week). A result is shown in Table 7. The average in Table 7 is a value according to the following valuation basis.
[0067]
Formula of yogurt: Cow's milk 50% Skimmilk powder 5% Emulsification constituent 1% Ion exchange water 44% Sum total 100% [0068] flavor valuation-basis: -- five point: -- **** is not sensed.
Four points: **** is sensed small.
Three points: **** is sensed.
Two points: **** is sensed strong.
One point: **** is sensed extremely strong.
[0069]
[Table 7]

乳化組成物	平均値
A	3.2
B	4.3

[0070] Table 7 shows that the emulsification constituent containing an emulsifier and an

antioxidant shows the effectiveness which was excellent compared with the emulsification (antioxidant is not contained) constituent only containing an emulsifier.
[0071] Example 8: After adding the oily mixed solution in which 20g of fish oil, 8g of purification coconut oil, and 0.5g of soybean lecithins were dissolved to the solution made to dissolve polyglycerin aliphatic series ester 4g and 0.5g of sodium L-ascorbate in the mixture of effect glycerol 45g and 20g of water by the particle diameter of an oil droplet and making it agitate and distribute it, it emulsified with the high-pressure homogenizer and the uniform emulsification constituent of about 0.20 micrometers of particles of an oil droplet was manufactured (this invention article 1). the particle diameter of an oil droplet -- laser -- it measured using] by diffraction type particle-size-distribution meter SALD-110[Shimadzu Corp. Moreover, by lowering the pressure of a high-pressure homogenizer, except having set the particle of the oil droplet of an emulsification constituent to about 0.7 micrometers, the same actuation as the process of the above-mentioned this invention article 1 was performed, and about 0.7-micrometer emulsification constituent was obtained for the particle of an oil droplet (comparison article 1).
[0072] (1) After saving this invention article 1 for one week at 60 degrees C, it diluted with ion exchange water 1000 times. About the flavor of this diluent, organoleptics were carried out to ten persons' special panelist. The result is shown in Table 8. The organic-functions evaluation average in Table 8 is a value according to the following valuation basis.
[0073] organic-functions valuation-basis: -- five point: -- a nasty smell is not sensed at all.
Four points: A nasty smell is not sensed almost.
Three points: A reversion flavour (****) is sensed small.
Two points: A reversion flavour (****) is sensed considerably.
One point: A strong reversion flavour (****) is sensed.
[0074]
[Table 8]

試料	官能評価平均値	
	保存前	保存後
本発明品1	4.4	4.3

[0075] As for this invention article 1, after 60-degree-C preservation for one week does not sense the reversion flavour of the DHA origin almost so that clearly from the result of Table 8.
[0076] (2) 160g of fruit-sugar grape-sugar liquid sugars and 0.5g of citric acids were dissolved in 90g water, 1g of this invention article 1 or the comparison article 1 was added in this solution, and the whole quantity was made into 1l. with aerated water. It capped after filling up a bottle, and sterilized for 20 minutes at 85 degrees C, and the carbonated drink was obtained. Standing preservation of the obtained carbonated drink was carried out for ten days at 60 degrees C, and condition observation was performed about the drink after preservation. The result is shown in Table 9. Each notation of front Naka expresses following semantics.
- R : generating of a neck ring is not accepted.
**R: Accept a neck ring slightly.
+ R : accept a clear neck ring.
+ +R : accept a remarkable neck ring.
[0077]
[Table 9]

試 料	60℃10日間保存後
	ネックリング
本発明品1	－R
比較品1	+R

[0078] Although generating of a neck ring was accepted by the drink which used the comparison article 1 so that clearly from the result of Table 9, generating of a neck ring was not accepted by the drink which used this invention article 1. Therefore, from this example 8, in using an emulsification constituent for a carbonated drink, it understands the particle diameter of the oil droplet that the smaller one is stable.
[0079] Example 9: The emulsification constituent was manufactured using the active ingredient shown in the stability following of an emulsification constituent content lactic acid bacteria beverage, the emulsifier, the antioxidant, and the hydrophilic medium. The lactic acid bacteria beverage was prepared using this emulsification constituent, and that stability was examined.
[0080]
Formula of an emulsification constituent: Content (%)
[Active ingredient]
Purification fish oil 50 (about 50% of DHA contents, about 15% of EPA contents)
[Emulsifier]
Deca glycerol mono-oleate 7 Cane-sugar monostearin acid ester 3 Zymolysis lecithin 0.5
[Antioxidant]
Sodium L-ascorbate 1 [Hydrophilic medium]
Glycerol 30 Water 8.5 </U> Sum total 100 [0081] (An emulsification constituent, and the manufacture approach and the stability test approach of a lactic acid bacteria beverage) The emulsification constituent was manufactured by dissolving an antioxidant and an emulsifier in a hydrophilic medium, and emulsifying using a homogenizer, after adding an active ingredient subsequently to this and carrying out stirring distribution. The lactic acid bacteria beverages A and B of the following formula were prepared using this emulsification constituent.
Formula of a lactic acid bacteria beverage: Content (kg)
A B [Component **] Skimmilk powder 1 1 Lactic-acid-bacteria culture 1 1 Ion exchange water 20 20 [Component **]
Sugar 8 8 Skimmilk powder 2 2 Pectin 0.4 0.4 Citric acid 0.1 0.1 Emulsification constituent 1 Nothing Purification fish oil Nothing 0.5 (about 50% of DHA contents, about 15% of EPA contents) Perfume (yogurt flavor) 0.1 0.1 Water 66.4 66.9 Sum total 100100 [0082] Fermentation milk was prepared with the conventional method using component **, and stericooling was performed beforehand. The lactic acid bacteria beverage was prepared by adding this into the mixture of component ** and homogenizing with a homogenizer. After carrying out refrigeration preservation of the prepared lactic acid bacteria beverage for two weeks, ten panelists estimated the flavor. A result is shown in Table 10. The average in Table 10 is evaluation according to the flavor valuation basis shown in the example 7.
[0083]
[Table 10]

乳酸菌飲料	平均値
A	4.6
B	3.8

[0084] From Table 10, when the lactic acid bacteria beverage containing purification fish oil .

makes the emulsification constituent of this invention contain shows that generating of **** is controlled.
[0085] Example 10: The emulsification constituent was manufactured using the active ingredient shown in the stability following of an emulsification constituent content pudding, the emulsifier, the antioxidant, and the hydrophilic medium. The pudding was prepared using this emulsification constituent and stability was examined.
[0086]
Formula of an emulsification constituent: Content (%)
[Active ingredient]
Purification fish oil 5 (about 5% of DHA contents, about 0.1% of EPA contents)
[Emulsifier]
Deca glycerol monostearin acid ester 3 Cane-sugar mono-oleate 1 [Antioxidant]
Sunflower seed extract 5 [Hydrophilic medium]
Glycerol 50 Water 36 Sum total 100 [0087] (An emulsification constituent, and the manufacture approach and the stability test approach of a pudding) The emulsification constituent was manufactured by the same approach as an example 9. The pudding of the following formula was prepared using this emulsification constituent.
Formula of a pudding: Content (kg)
All fat sweetened condensed milk 6 Skimmilk powder 5 Purification palm oil 4 Sugar 9 Sugar-added yolk 8 Gelling agent 0.5 Perfume 0.2 Emulsification constituent 0.5 Water 66.8 Sum total 100 [0088] Sterilization was performed for 10 minutes at 85 degrees C after dissolving the above-mentioned raw material. Subsequently, after homogenizing with a homogenizer, the pudding was prepared by filling up a container and cooling. The flavor was evaluated after saving the prepared pudding for two weeks at 7 degrees C. Consequently, there was no degradation of a flavor.
[0089] Example 11: The emulsification constituent was manufactured using the active ingredient shown in the stability following of an emulsification constituent content vienna sausage, the emulsifier, the antioxidant, and the hydrophilic medium. The vienna sausage was prepared using this emulsification constituent, and that stability was examined.
[0090]
Formula of an emulsification constituent: Content (%)
[Active ingredient]
Purification fish oil 10 (about 35% of DHA contents, about 10% of EPA contents)
[Emulsifier]
Deca glycerol monostearin acid ester 2 Deca glycerol mono-oleate 3 [Antioxidant]
Erythorbic acid 0.5 [Hydrophilic medium]
D-sorbitol 60 Water 24.5 Sum total 100 [0091] (An emulsification constituent, and the manufacture approach and the stability test approach of a vienna sausage) The emulsification constituent was manufactured by the same approach as an example 9. The vienna sausage of the following formula was prepared using this emulsification constituent.
Formula of a vienna sausage: [Component A] Content (kg)
Pig Woody meat 7 Lard 1 Iced water 2 10 [Component B]
Salt 150 Sodium nitrite 5 Polymerization sodium phosphate 50 Speiss mix 50 Sodium L-glutamate monohydrate 10 Sugar 20 sorbic acid potassium salt 20 Starch 300 Emulsification constituent 200 Sum total According to the conventional method, the ground was prepared using the 805 above-mentioned components A and B, sheep casing was filled up, after desiccation and a smoke, sterilization and cooling were performed and the vienna sausage was prepared.
[0092] It tried, after saving the prepared vienna sausage for two weeks in a refrigerator. Consequently, it has good flavor and **** was not sensed.
[0093] Example 12: The emulsification constituent was manufactured using the active ingredient shown in the stability following of emulsification constituent content soft drinks, an emulsifier, an antioxidant, a hydrophilic medium, and other oil solubility components. Soft drinks were prepared using this emulsification constituent, and that stability was examined.
[0094]

Formula of an emulsification constituent: Content (%)
[Active ingredient]
Purification fish oil 5 (about 35% of DHA contents, about 10% of EPA contents)
Oil solubility component] besides [
Beta carotene 0.5 Medium chain triglyceride 5 Orange oil 0.5 SAIB10 (shoe cloth acetate ISOBUCHIRETO) [Emulsifier]
Deca glycerol mono-oleate 6 Zymolysis lecithin 0.1 [Antioxidant]
L-ascorbic acid 0.5 [Hydrophilic medium]
Glycerol 50 Water 22.4 Sum total 100 [0095] (An emulsification constituent, and the manufacture approach and the stability test approach of soft drinks) The emulsification constituent was manufactured by dissolving an antioxidant and an emulsifier in a hydrophilic medium, and emulsifying using a homogenizer, after, adding the mixed solution which carried out the heating dissolution of an active ingredient and other oil solubility components subsequently to this and carrying out stirring distribution.
[0096] The soft drinks of the following formula were prepared using this emulsification constituent.
Formula of soft drinks: Content (kg)
Fruit-sugar grape-sugar liquid sugar 15 Orange transparence fruit juice (1/5 concentration) 0.2 L-ascorbic acid 0.1 Citric acid (crystal) 0.2 Sodium citrate 0.05 Orange flavor 0.1 Emulsification constituent 0.2 Water 84.15 Sum total 100 Soft drinks were prepared by sterilizing the above-mentioned raw material after mixing and the dissolution, and cooling.
[0097] The flavor was evaluated after saving the prepared soft drinks for three months at a room temperature. Consequently, **** was not sensed. Moreover, about the drink before and behind preservation, oil was extracted by n-hexane, respectively and POV (Peroxide Value) was measured. The result is shown in Table 11. The unit of POV is meq/kg among Table 11.
[0098]
[Table 11]

	POV
保存前	0.9
保存後	1.1

[0099] Even if it saved for three months at the room temperature so that clearly from Table 11, most rises of POV were not accepted.
[0100] Example 13: The emulsification constituent was manufactured using the active ingredient shown in the stability following of an emulsification constituent content hard candy, an emulsifier, an antioxidant, a hydrophilic medium, and other oil solubility components. The hard candy was prepared using this emulsification constituent, and that stability was examined.
[0101]
Formula of an emulsification constituent: Content (%)
[Active ingredient]
Purification fish oil 10 (about 25% of DHA contents, about 10% of EPA contents)
Oil solubility component] besides [
Gamma-linolenic acid oil (25% of gamma-linolenic acid contents) 10 [Emulsifier]
Deca glycerol palmitic-acid ester 6 Soybean lecithin 0.5 [Antioxidant]
Apple extract 1 Extract tocopherol 0.5 [Hydrophilic medium]
Glycerol 72 Sum total 100 [0102] (An emulsification constituent, and the manufacture approach and the stability test approach of a hard candy) After adding the mixed solution which was made to dissolve an antioxidant and an emulsifier in a hydrophilic medium, and was made to dissolve an active ingredient and other oil solubility components in it subsequently to this and carrying out stirring distribution, the emulsification constituent was manufactured by emulsifying using a homogenizer.
[0103] The hard candy of the following formula was prepared using this emulsification constituent.

Formula of a hard candy: Content (kg)
Sugar 60 Starch syrup 40 Citric acid (crystal) 0.7 L-ascorbic acid 0.05 Coloring matter 0.05 Perfume 0.3 Emulsification constituent 0.4 Water 20 Sum total 100 According to the conventional method, the hard candy was prepared using the above-mentioned raw material.
[0104] The flavor was evaluated after saving the prepared hard candy for three months at a room temperature. Consequently, **** was not sensed.

[Translation done.]